Site Locations and Archaeologically Significant Areas in the Southern Lakes District, Yukon Territory

Final Report

Contract # 1630-2-084

Archaeological Survey of Canada, National Museum of Man,

National Museums of Canada, Ottawa

Sheila C. Greer

10803 - 85th Avenue,

Edmonton, Alberta, T6E 2L2.

March, 1983

Acknowledgements

The crew for the 1982 field season were Bruce Jamieson and Sharon Baillie (both of McGill University) who spent the entire summer with the project, and Lisa Barrett and Michelle Sutton (Carcross) and Kerry Guenter (Whitehorse) who joined the crew in August. Judy Marsh of the Archeological Survey of Canada provided the computer printouts of Southern Lakes site data that were used in the study. Jacques Cinq-Mars of the Archaeological Survey of Canada and Al Hodgson of the Resource Planning Office, Dept. of Renewable Resources, Yukon Government initiated the project and provided various means of support for both the field work and lab study of site locations.

Table of Contents

1.	Introduction	1
2.	Project Background and Goals	3
3.	The Study Area	6
	3.1. Environmental Overview	6
	3.2. Physiography, Geology, Glacial History and Soils	11
4.	Human History and Archaeology	15
	4.1. Ethnographic Baseline and Early History	15
	4.2. The Archaeological Record	18
5.	Areas Surveyed for Sites	25
	5.1. Previous Archaeological Work	25
	5.2. Summary of 1982 Field Activities	27
6.	Assessing Archaeologically Significant Areas	31
	6.1. Introduction	31
	6.2. Method Used in Study of Site Locations	33
	6.3. Site Location Patterns	38
	6.4. Context of the Actual Archaeological Deposits	46
7.	Summary and Conclusions	51
	References Cited	54
Appendix A	Summary of Sites Recorded in the 1982 Field Season	57
Appendix B	List of Sites Used in Study of Site Locations (along with their terrain type and other data)	66

List of Figures

Map	Southern Lakes District (shows boundaries of 1:100,000 scale maps titled "Archaeologically Significant Areas, Preliminary" on file Dept. of Renewable Resources, Yukon Government)	7

List of Tables

Table 1	Genetic Materials and Soil Associations Found in Study Area	34
Table 2	Frequency of Sites by Terrain Type	39
Table 3	Frequency of Sites by Dominant Soil Type	41
Table 4	Frequency of Sites by Genetic Materials	42
Table 5	Frequency of Sites by Closest Waterbody	44

1. Introduction

Close to five hundred archaeological sites have been recorded in the Southern Lakes district of Yukon Territory. This report represents an initial effort to study the locations of these sites and to assess areas of archaeological significance in this area. The work of various researchers has been drawn together to see where sites have been found, where sites have been looked for, and where sites may be located.

In recent years there has been a growing demand from various government (federal, territorial and native) offices and private agencies for information on archaeological sites in the Southern Lakes area. This interest stems from a need to avoid the destruction of sites with future development projects and from a desire to learn about and interpret the prehistory of the Southern Lakes area.

However, in spite of the fact that many sites have been recorded here, only a small amount of the study area has been examined for sites. Therefore, though we may know that certain locales are of archaeological significance because valuable sites have been found there, it is difficult, if not impossible to evaluate the archaeological significance of areas that haven't been examined for sites.

As a partial solution to this problem, the present project was developed to see if information that would be useful for predicting site locations could be obtained by studying known site settings. To do this, 483 site locations were plotted on a series of seven maps (scale 1:100,000) for the study area which outlined soils and surficial geology terrain units. The terrain type for each site was recorded, and then the patterns in site location were studied.

The known sites in the study area show some distinct patterns in

their locations, which, while perhaps not a true representation of all site locations in this region, may nonetheless be useful for assessing the archeological potential of areas not yet surveyed for sites.

The contents of this report include a review of the background to the current project and of the environment, the human history and archaeological record of the study area. This information should provide the reader with an insight into the types of archaeological remains found here.

Following the background information, the history and location of archaeological surveys in the area will be presented. This will be followed by a summary of the field work conducted for the present project.

In chapter six, the method used to study site locations and assess archaeologically significant areas will be outlined. This will be followed by a discussion of the geological/geomorphological context of sites and a discussion of patterns in site topographic placement. The potential sediment types within which actual archaeological deposits may be found will also be considered. This report concludes with a summary of the context of site locations in the study area.

2. Project Background and Goals

The present study is a continuation of an archaeological site inventory programme initiated in the Southern Lakes District in 1980 (Greer 1981). That project, cosponsored by the Archaeological Survey of Canada, National Museums of Canada and the Department of Renewable Resources, Yukon Territorial Government, saw two archaeological field teams (led by J. Hunston and the author) recording sites in the study area. The project goal was to identify sites and to develop our understanding of the region's prehistory in order to provide much needed background information for future development and impact assessment projects.

The 1980 site inventory was coordinated with an inventory and mapping of soils, geology, vegetation and acquatic resources by the Ecological Land Survey Program of the Department of Renewable Resources, Yukon Government (Government of Yukon 1979). During the three month field season, field logistic facilities were shared with research teams from this office.

For a number of reasons a sampling program could not and was not employed in the 1980 site inventory project. Locales known to be of archaeological potential, based on the researchers' past experience in Yukon archaeology, were examined for sites. We spent little field time examining areas that had been surveyed by earlier archaeologists or looking for sites around the modern settlements. However, because we had access to a helicopter, we were able to undertake some survey work in the more isolated parts of the study area, in addition to those accessible by ground transporation. A listing of the general location of our 1980 survey efforts is given in section 5.1. of this report.

The 1980 survey was intensive, though not exhaustive, in its coverage. Over 270 new sites were recorded that field season. Even though only a small part of the study area was examined for sites, this project demonstrated that significant archaeological resources existed here.

The present project was supported by the same two government offices. The Department of Renewable Resources wanted information on archaeologically significant areas in the Southern Lakes area for future planning purposes, while the Archaeological Survey of Canada wished to see research which studied patterning in site locations as well as work which would collect regional prehistoric chronological data. They saw a need to draw together the past work of various archaeologists into a useful whole and a need to begin examining sites in detail.

In order to fulfill these broad objectives, data on all past archaeological work in the study area was drawn together, and all site records examined. It was apparent that in order to assess areas of archaeological significance further survey work was required. However, due to the size of the study area, the available financial resources and logistical constraints, a field program which sampled various environmental zones for sites could not be followed.

Because of these limitations, existing site records had to form the basis for assessing archaeologically significant areas. Detailed surficial geology and soils interpretive maps recently prepared by the Dept. of Renewable Resources provided an opportunity to study the physical context of the site locations. However, since the project contract called for field work, it was decided to spend time surveying a few specific locales that were believed to be of high archaeological potential and testing some sites. Details of the field work completed in the

1982 season are summarized in section 5.2. of this report.

Additional funds in support of the 1982 field work came from the Arctic Working Group, University of Toronto and the Arctic Institute of North America, University of Calgary. These monies were provided in support of the author's thesis research on late prehistoric land-use and economic patterns in the Southern Lakes district (Greer 1982a). They were used to complete test excavations at two sites (JcUr-3, the Annie Lake site and JcUj-12, the Desquanga site) which had been selected for detailed investigation.

3. The Study Area

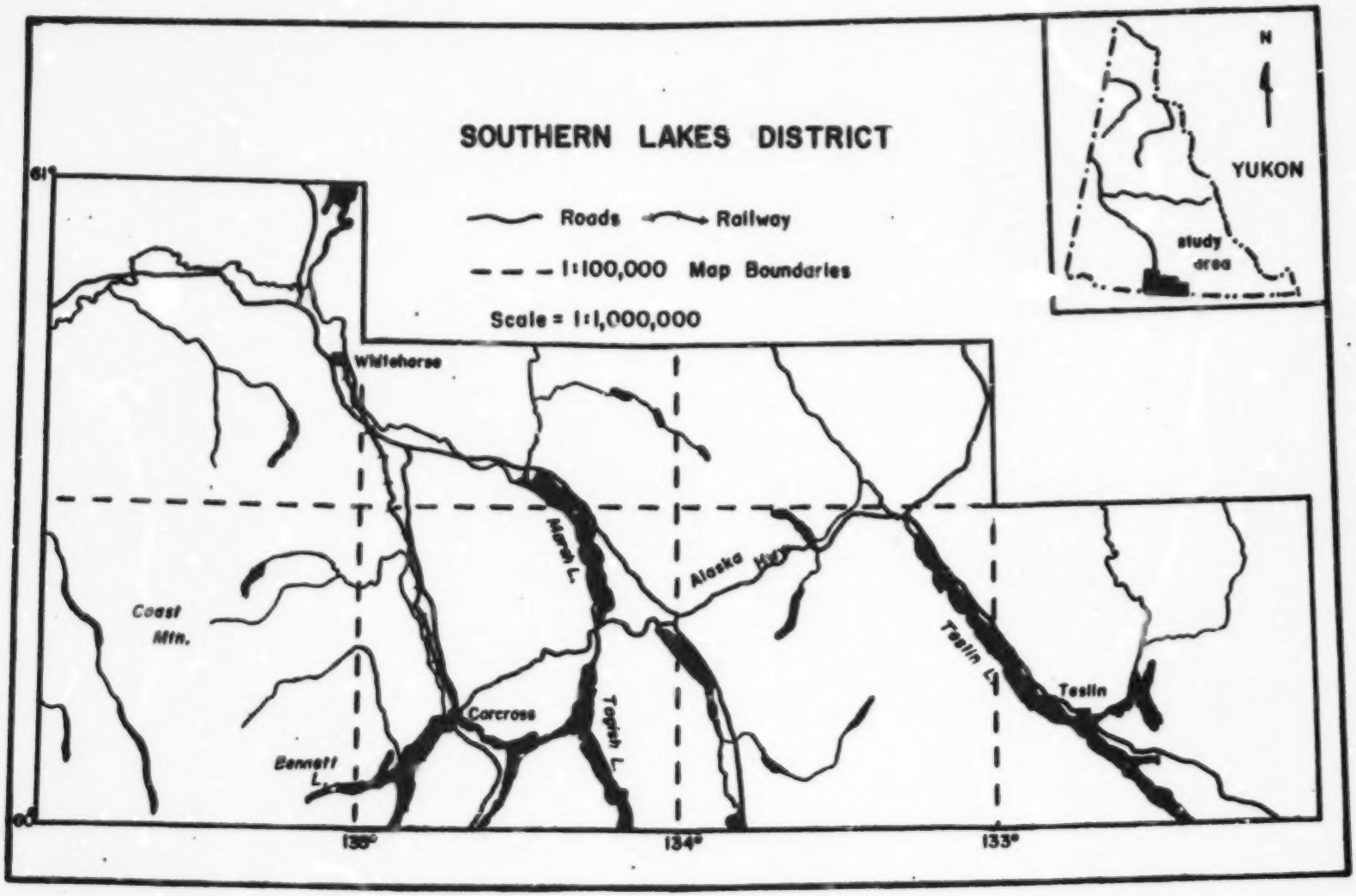
3.1. Environmental Overview

The Southern Lakes District is situated in the south-central part of Yukon Territory, adjacent to the Yukon - British Columbia border, not far from the northwest Pacific coast (map). It covers a region of approximately 18,000 square kilometres and for administrative purposes is defined as a planning area by the Yukon Territorial Government. The study area includes most of the Whitehorse map sheet (# 105D) and the southwestern two-thirds of the Teslin map sheet (# 105C) (scale 1:250,000).

The region includes parts of the Coast Mountains (Boundary Ranges) and the high interior Yukon Plateau (Bostock 1948). It was more or less completely glaciated during the late Pleistocene ice advance, probably by earlier advances as well, and extensive deposits of glacial drift mantle the lower elevations. Further details on the geology, physiography, glacial history and soils of the region are provided below.

The Southern Lakes area forms a large part of the headwaters of the Yukon River basin. It contains several major lakes (Tagish, Bennett, Marsh, Little Atlin, Teslin and parts of Laberge and Atlin lakes) for which it was named, as well as the Yukon/Lewes, Takhini, Ibex, Watson, Wheaton, Tagish, Lubbock, McClintock, Teslin and Nisutlin Rivers. Chains of small lakes occur in the valley bottoms in the plateau region, while long, narrow waterbodies (Rose, Primrose and Takhini Lakes) are found within the Coast Mountains.

The area is characterized by an interior subarctic climatic regime, i.e., long, cold winters and short, warm summers, though some moderating influence from the nearby northwest coast is felt here (Oswald & Senyk


SOUTHERN LAKES DISTRICT
Roads
Railway
1:100,000 Map Boundaries
Scale = 1:1,000,000
N
YUKON
study area
Whitehorse
Marsh L.
Alaska Hwy
Coast Mtn.
Carcross
Tagish L.
Tesline L.
Teslin
Bennett L.
60°
130°
134°
133°

1977). Precipitation is low, particularly in the western parts of the study area which lie in the rainshadow of the Coast Mountains. Carcross receives less than 250mm per annum; the highest precipatation (346mm per annum) is recorded at Johnson's Crossing (ibid.).

The flora varies between the Plateau and the Coast Mountains parts of the district. The former is well forested, while much of the latter lies above treeline (1050-1200m) (ibid.).

In the Plateau region open stands of white spruce are dominant. Fire has been a major factor in stand development, with lodgepole pine occupying the burn areas (ibid.). Black spruce is found on wetter sites, while aspen occurs on warmer aspects. Alpine fir is found in the subalpine parts of the Plateau region below 1200-1350m. The understory of the Plateau region forests is feathermoss, with or without shrubs and/or forbs. Sagewort grassland can be found on steep silty river banks and on low elevation dry slopes (ibid.).

In the Coast Mountains, the valley bottoms feature open white spruce forests on terraces and low elevation slopes, closed white spruce on alluvial soils, and aspen in burn areas (ibid.). Low elevation shrub communities of soapberry and willows, as well as those of moss, herbs, griminoids and ericaceous shrubs are also common. Shrub birch and willow dominant the subalpine areas. Lichen, ericaceous shrubs and willows occur in alpine areas (ibid.).

A systematic study of the climatic and vegetation history of this area has not been completed, though information derived from studies in surrounding regions is of interest. Because environment determines game resources, and therefore the potential subsistence base of prehistoric cultures, some of this data will be briefly summarized.

Paleobotanical research using pollen core data has been completed in the Atlin area by Miller and Anderson (1974). The data base includes one core from a bog near Little Atlin Lake. Their pollen data shows that, in the Atlin area, a shrub tundra is present by 11,000 years ago, and shortly thereafter (10,500 BP) spruce first appears, though tundra (herbacerous or shrub) is dominant until 9,000 BP. After this, spruce woodlands were the dominant vegetation type at lower elevations. The Holocene thermal maximum is recorded from ca. 8000 to 2500 BP, during which warmer and wetter conditions saw mixed spruce and alder or fir forests, as dominant. After the thermal maximum, neoglacial activity is recorded in the Boundary Ranges, and cooler, dryer conditions are suggested for the interior by the dominance of white spruce and pine forests. In the past 750 years, conditions have tended to be warm and wet again, though spruce and pine forest have still been dominant at lower elevations (ibid.).

In contrast to this data from the Atlin area, and based on other techniques of paleoenvironmental research, Johnson and Raup (1964), suggested that grasslands may have been common in the southwest Yukon (Kluane area) throughout the early Holocene. If grasslands were common in the study area as well at this time, large mammals such as bison may have been the mainstay of the prehistoric economy. Research into the vegetation history of the southcentral Yukon is needed to clarify this and other paleoecological problems. It is encouraging to know that Dr. L. Cwynar of the University of Toronto has recently initiated a paleobotanical study in this area.

The modern fauna of the Southern Lakes District is that typical of the subarctic interior cordillera region. The mammal species of econo-

mic importance to the native peoples of this area include caribou, thinhorn sheep, moose, mountain goat, beaver, bears, ground squirrel, hare, wolf, and various furbearers (McClellan 1975). No paleoontological studies have been conducted for the southern Yukon, though Bison remains were recovered from an archaeological site in the Carcross area a number of years ago. These remains most likely date from sometime during the first half of the Holocene period. Elk and mule deer may have been available here at times during the past as well.

Various grouse and ptarmigan species occur here and are of economic significance. The outlets of the major lakes (Bennett, Little Atlin, Marsh, Tagish and Teslin, plus Nisutlin Bay) are important staging areas for migratory avifauna (Theberge, Nelson and Fenge 1980). Numerous fish species can be obtained in the study area and there are many waterbodies which can be characterized as good winter fish lakes (McClellan 1975). Though spawning salmon do reach these waters, they are less abundant and of poorer quality here than in rivers such as the Alsek or the Taku which drain only a comparatively short distance into the Pacific Ocean.

Today the majority of the Territory's population lives within the Southern Lakes District. It includes the city of Whitehorse, as well as the communities of Carcross, Teslin, Tagish, and Johnson's Crossing. Roadways through the district are the Alaska Highway, the Klondike Highway, the South Canol Road, the Tagish-Carcross Road, the Atlin Road, as well as a few other minor roads and cart trails. The WhitePass and Yukon Railway runs from Whitehorse south to Skagway on the Pacific coast.

3.2. Physiography, Geology, Glacial History and Soils

The following overview of the physiogrpahy, bedrock and surficial geology and glacial history and soils is based on summaries prepared by K. McKenna, Dept. of Renewable Resources, Y.T.G., for the final report on the Southern Lakes resource inventory (in preparation). It relies on the published data of various researchers, including that of Bostock (1948), Hughes, Campbell, Muller & Wheeler (1969), Mulligan (1963) and Wheeler (1961), as well as on field data collected in 1980 by S. Morison, project geologist for the Resource Inventory Program, Dept. of Renewable Resources. Considerable more detail has been given to describing this aspect of the environment since it has been used in the study of site locations.

Though mountainous, the physiography of the Southern Lakes study area is quite diverse. In the southwest are the steep, Coast Mountains, while the north, central and east features the broad valleys, rounded hills and large lakes of the Interior Yukon Plateau region.

The Boundary Ranges of the Coast Mountains, which reach heights of more than 2300 metres, feature many small cirque glaciers at higher elevations. The classic U-shaped valleys found in these mountains create a particularly rugged terrain. These mountains are composed mainly of Cretaceous acid intrusives.

The subdued Teslin and Nisutlin Plateaus, part of the Interior Yukon Plateau system, are characterized by major northwest - southeast trending valleys occupied by large lakes and rivers. The valleys bottoms here lie around 740 to 680 metres in elevations, while the mountain tops reach heights of 1900 metres. Paleozoic limestone forms most of the bedrock surface in the southern areas, while the north and centre

regions are characterized by early Mesozoic volcanics and clastic sediments and their metamorphosed counterparts, and local Creataceous granitic intrusions as well.

On the eastern edge of the study area are the northwest - southeast trending Big Salmon Range of the Pelly Mountains at elevations of ca. 1800-1900 metres, and the Englishmans Range of the Cassiar Mountains at ca. 2000 metres. These mountains are largely composed of acid intrusvie rocks. Both ranges feature numerous old cirque basins.

During the late Pleistocene the Southern Lakes District was glaciated by the northwestward moving McConnell advance of the Cordilleran ice sheet from the Cassiar Mountains to the southeast. In the northwest part of the study area this lobe probably came in contact with a northward moving ice sheet which originated south of and then dominated the Coast Mountains. During the height of the glaciation only nunataks remained ice free, and evidence for earlier glaciations was obliterated.

Numerous terrain features in the study area document the above glacial movements, including drumlin fields, bedrock fluting, bedrock striations, and the distribution of erratics. Glacial drift mantles most of the valley bottoms to elevations around 1670 metres.

Though no radiocarbon dates are available for the retreat of the late Pleistocene ice sheet from the area, it was probably largely ice free by 11,000 years ago. Retreat of the ice does not mean an area suitable for human habitation however, since during deglaciation, the major valleys were occupied by glacial lakes dammed between retreating ice margins, stagnant ice and the valley walls. Glacial Lakes Champagne and Carcross, with former lake levels around 760 metres, dominated the northwest and southcentral parts of the study area respectively. Many

smaller valleys were also dammed at this time. The former extent of these glacial lakes are marked by strandlines, high level terraces and lacustrine plains.

Esker and kame complexes, deposited within bodies of stagnant ice disassociated from the main body of retreating ice, are found in several valleys. Glaciofluvial outwash plains, terraces and deltas are also common valley features in the Southern Lakes area. During deglaciation the general drainage trend was probably toward the west and northwest.

Following deglaciation, extensive wind erosion and deposition occurred.. Thick sand aeolian blankets with parabolic dune development are found in several localities, but more commonly, a thin discontinuous loess layer is found overlying many lacustrine, morainal and glaciofluvial deposits. Most of the archaeological sites recorded in the study area have been found within these discontinuous aeolian sediments.

Throughout the area, further modifications to the immediate postglacial landscape have occurred. Evidence for neoglacial activity can be found in the Coast Mountains and the Big Salmon and Englishman Ranges, along with active cirque glaciers. Extensive colluviation has occurred on steep terrain, creating fans and aprons at the base of slopes, or on morainal and colluvial complexes where solifluction or slumping have taken place. Fluvial activity has also altered the landscape: alluvial fans and blankets are found at the base of slopes, and older alluvial, glaciofluvial, morainal and lacustrine materials have been dissected and gullied by more recent streams.

Some peat development has occurred in alpine valleys above 1070 metres in elevation. On poorly drained lower slopes and in valleys organic veneers may overlie permanently frozen ground. Permafrost

occurs in high alpine situations associated with crypoturbation and patterned ground, and in lower seepage slopes. Thermokarst terrain is found in some valley bottoms.

A discontinuous white volcanic ash layer up to several centimetres in thickness, the eastern lobe of the White River ash, dated to ca. 1250 BP (Lerbekmo, Westgate, Smith and Denton 1975) occurs throughout lower elevations. It has been found in many archaeological sites, where it provides a convenient stratigraphic marker. Workman (1978:52 ff.) has discussed the possible consequences of this natural catastrophic event for the ecology of the southern Yukon.

The soils of this area are quite varied due to ranges in parent material, topography (site conditions, slope and elevation), climate and vegetation. Because of the abundance of gravelly sandy to silty till deposits and glaciofluvial sands and gravels, the soils are dominantly medium to coarse textured. Most parent materials are slightly to very strongly acid, though some alkaline soils are found on moderately to strongly calcareous lacustrine morainal and alluvial deposits. The predominance of coniferous trees has also increased the acidity of the soils here.

Generally, the soils here are not well developed. Those of the Brunisol order are dominant, with Orthic Eutric and Orthic Dystric Brunisols being most common. Other major soil orders represented in the study area are the Gleysols, Regosols, Cryosols, Organics and Luvisols.

4. Human History and Archaeology

4.1. Ethnographic Baseline and Early History

Archaeological research extends our knowledge of human history back beyond the period of written records through the investigation of sites dating to the prehistoric period. Archaeological techniques can also be used to study historic period sites, whether they represent the remains of native, non-native (or both) social groups. Since we are concerned with human history, as a background to archaeology and prehistory it is appropriate to briefly describe traditional lifeways and land-use practices and to summarize the area's written history and historic land-use patterns.

Because the written history of this part of Yukon is not of great antiquity, there is a limited body of literature which contains observations on traditional native lifeways. Native elders' recollections, stories and place names e.g., McClellan 1975, Sidney 1980, 1982, are the major sources of information. Archaeological research both complements and supplements these information sources, and extends our knowledge of traditional lifeways back into prehistoric times.

The Southern Lakes District includes a large part of the traditional territory of the Athapaskan-speaking Tagish people, as well as part of the lands used by the Inland Tlingit and the Athapaskan-speaking Southern Tutchone peoples (McClellan 1975). These peoples were subsistence hunters and fishermen who lived in small groups of only a few families for most of the year. They were highly mobile, moving camps many times during the year, in order to exploit locally abundant food resources. It is likely that only during historic or protohistoric times did they settle permanently or seasonally in communities such as

Carcross, Tagish, and Teslin (ibid.).

During the protohistoric period (the eighteenth and the nineteenth centuries) the native peoples of southwest and southcentral Yukon were also trapping for furs. They were involved in the northwest coast fur trade via their trading intermediaries, the coastal Chilkoot and Chilkat Tlingit (McClellan 1964). The Tlingit monopolized this trade, and did not allow the whites to cross the mountains and deal directly with southern Yukon Indians. They made yearly trips to the interior to exchange Russian, and later American, trade goods for the top quality Yukon furs. Some Tlingits married interior women (ibid.).

In the same way that the Tlingit operated as trading middlemen between the Europeans and the southern Yukon Indians, these people in turn were also trading middlemen, exchanging goods for furs with Indian groups who lived further inland (ibid.).

The southern Yukon Indians were heavily influenced by the Tlingit during the protohistoric period. The Tagish and many of the southern Tutchone adopted the language and other aspects of Tlingit culture. It is also believed that the ancestors of the Teslin Tlingit people migrated into the eastern portion of the study area from the Taku River basin at this time (McClellan 1964, 1975).

McClellan believes that the vibrant trading of the protohistoric period was based on prehistoric exchange between coastal and interior peoples who each had access to types of resources that the other did not (1964). A shell bead of probable coastal origin has been collected from a prehistoric site in the Whitehorse area (JeUs-3, J.Hunston, personal communication, 1982), evidence for the existence of such trade.

The Tlingit kept a tight control on the mountain passes which gave

access to the interior, and it was only around 1880 that they allowed the first outsiders, prospectors, to enter the Southern Lakes area (McClellan 1964, Wright 1976). In 1883 a U.S. army lieutenant, F. Schwatka, passed through the Southern Lakes district on a military reconnaissance. He was the first outsider to observe and report on this area (Schwatka 1885).

Schwatka visited the Tagish people at their summer camp on the Tagish River. Here he noted two permanent structures, constructed in the coastal style and quite unlike the other native houses he observed during his Yukon River trip, evidence of Tlingit influence in this area during the nineteenth century.

Only a short time after Schwatka's visit, the cultural makeup of the area was quickly and greatly altered by the Klondike Gold Rush (McClellan 1964, 1975). The Tagish Northwest Mounted Police post, a shortlived post established to process the thousands of men proceeding northward through the Southern Lakes area in 1898, is a recorded as a historic archaeological site.

Very quickly, the natives became a minority in their homeland, and land-use practices greatly changed here. Permanent settlements grew at Whitehorse, and then Carcross, when the railway was constructed. Inventories of early historic buildings in these two communities have been completed (Yukon Historical and Museums Association n.d., 1980).

During the early part of the twentieth century the Southern Lakes area was the scene of considerable mining activity. Though none of these remains, including the abandoned Conrad City, are recorded as archaeological sites, they nonetheless document a phase of Southern Lakes history.

Native land-use patterns have also changed in historic times of course. Still, many prehistoric site locations are used as bush or fish camps by Carcross and Teslin area families in modern times. This shows that there is some continuity in land-use between prehistoric and recent times.

After the Gold Rush of 1898, a second great change in land-use patterns was brought about with the construction of the Alaska Highway through the study area. This brought about the end of the lake steamers as a principal mode of transportation here, and initiated permanent settlement at Teslin (Teslin Women's Institute n.d.) and Johnson's Crossing.

4.2. The Archaeological Record

Though close to 500 archaeological sites have been recorded in the Southern Lakes area, very little is known about the prehistory of this area since only recently have sites been investigated in detail. Most of the sites were identified, recorded, and then paid no further attention. They are poorly understood i.e., we do not know when they were occupied, for what purposes they were used, and what prehistoric culture they represent the remains of.

Nonetheless, it is worth characterizing the types of sites and remains which have been found here and outlining the possible prehistoric chronological record. Much of the latter information comes from archaeological work completed in the nearby southwest Yukon (Aishihik-Kluane area), which is expected to be somewhat comparable to the Southern Lakes. Preliminary assessments of data collected during the 1982 field work in this area (Greer, 1982) has also been incorporated into

this section.

Prehistoric sites in the Southern Lakes area have most commonly yielded stone tools, such as projectile points, bifacial knives, scrapers, retouched or cutting flake tools, and the abundant flaking debris which is the byproduct of stone tool production. Bone and antler, whether tools such as leisters, fish hooks, etc. (or fragments thereof) or animal bone from dietary consumption, is sometimes but not always preserved in sites here. Bone appears to be more commonly found in more recent prehistoric sites or site components, particularly those which post-date the White River ash fall at ca. 700 AD.

Many of the sites here can be characterized as small camps, likely the remains of a few families who camped together while exploiting a particular resource whether it be a sheep herd, caribou herd, fish run, ripe berries, etc. Some sites that can be considered short-term ones, perhaps game lookouts, have been recorded. Sites which appear to be lithic workshop or tool production areas have also been found here.

The stone tools which have been collected are mostly made of different varieties of chert or other silicified sedimentary materials, though tools and flakes of obsidian are commonly found here as well. Some of these obsidians may have been traded into the Southern Lakes area from sources such as Mount Edziza in northern B.C., Airdrop Lake in Kluane National Park, or from other unlocated obsidian sources in northwest North America. Flakes of ignimbrite and quartz crystal have also been found in sites here.

No obsidian sources have been recorded in the Southern Lakes district, though they may well exist in areas close to but outside the study area boundaries. One chert source (site JaUm-2) has been identi-

fied beside Tagish Lake and, given the abundance of limestone bedrock in the southern parts of the study area, other sources for good quality, flakeable cherts no doubt exist here. As well, because glacial activity has extensively modified the landscape, it is possible that workable chert cobbles could also have been obtained by prehistoric flintknappers in gravel deposits throughout this region. Two lithic workshop sites (JbUv-1, featuring chert materials, JdUt-5, featuring silicified sedimentary materials) recorded in the Coast Mountains are probably situated close to raw material source areas.

In addition to obsidian, a few other prehistoric trade goods have been collected from sites in the Southern Lakes area. They include an arrowhead of native copper (from site JcUw-3) and fragments of native copper (from various sites). These copper pieces may have come from the White or Copper River areas to the northwest. Shells, shell fragments (from various sites) and a shell bead (site JbUm-1) which may have originated on the coast have also been found.

Chronologically, the earliest remains to be found here would most likely be post-glacial in age. Sites have been found on beach lines and terraces associated with Glacial Lakes Champagne and Carcross, but we do not know if they were occupied when these lakes were in existence. None of the artefacts collected to date from these sites are types of suggested great antiquity.

The earliest archaeological materials found at the Canyon site (JfVg-1) at Champagne, west of the study area, have been radio-carbon dated to approximately 7200 B.P. (Workman, 1974). The find includes bison bones and convex based projectile points, one of which is burinated.

One of the oldest types of stone tools found in both the Southern Lakes and southwest parts of Yukon are microblades. These small, long and narrow parallel-sided stone blades are believed to have been used as lateral insets in bone or antler points. Technologically, microblades are quite distinct, as are burins, an engraving type tool with which they are believed to be associated. These tools have been taken by Workman (1978) as one of the hallmarks of the Little Arm phase or prehistoric culture which is believed to have existed in southwest Yukon from around 8000 years B.P. to around 5000 years B.P. It is possible that the makers of these unique stone tools were descended from peoples who lived in eastern Beringia i.e., interior unglaciated Alaska-Yukon, at the end of the Pleistocene and migrated into south Yukon after it became ice free.

Microblades or related tool elements are known from some sites in the study area. A few microblades, a microblade core tablet and burinated bifaces have been surface collected from various sites here. Excavations at site JeUv-36 in the Ibex valley during the pipeline studies recovered a burinated lanceolate point, a wedge shaped microblade core, a microblade core rejuvenation flake along with eight side and end scrapers from a buried component below the White River ash (Damp & Van Dyke 1982). A few microblades were collected from the lowest level (below the volcanic ash layer) at the Annie Lake site (JcUr-3) during the recent excavations there, and one microblade specimen was recovered from below the ash layer at the Desquanga site (JcUj-12) as well (Greer 1982).

It is not known what happened to the descendents of the microblade producing Little Arm culture though it appears that after 5000 years ago

the southwest Yukon, and perhaps the Southern Lakes area as well, was occupied by prehistoric peoples who made quite different tools.

Workman (ibid.) refers to the next prehistoric culture to occupy the southwest Yukon as the Taye Lake phase, part of the Northern Archaic Tradition. This archaeological culture is characterized by fairly large stone spear points. Some of these points feature large sidenotches (for hafting purposes) while others have straight bases and tapering sides, and others are wide and leaf-shaped with straight or concave bases. Unlike the Little Arm culture, the Taye Lake one is much better known, and a larger variety of stone tool types are known from it. These tools include large bifacial and unifacial knives, boulder spall and tabular spall scrapers, small and large end and side scrapers, various bone and antler tools and some ground and polished stone tools as well (ibid.).

Tools which can be considered similar to those of the Taye Lake phase e.g., large notched points, bifacial knives, have been collected from sites in the Southern Lakes district, which suggests that this area was occupied by related peoples.

In the study area possible Taye Lake remains are most easily recognized by their stratigraphic position i.e., when they are found below the White River volcanic ash layer, thus predating ca AD 700. A number of sites or site components have been identified below the ash layer, but these are as yet poorly known.

Excavations at both the Annie Lake (JcUr-3) and Desquanga (JcUj-12) sites recovered evidence for prehistoric occupations which predated AD 700 (Greer 1982). At Annie Lake, a number of pre-ash occupations seem to be represented, including the previously mentioned microlithic remains. Two complete specimens of a previously unknown point type (a

small lanceolate specimen with a deeply concave base) were recovered at Annie Lake, above the microblades, and another pre-ash occupation was encountered immediately below the ash layer. Most of the artefacts recovered from the site were stone flakes. Two complete points, one a Whitehorse type (MacNeish 1964) i.e., short, wide specimen with a concave base, the other a small lanceolate specimen with a straight base, plus the base of a notched point, were recovered below the ash layer at Desquanga. The various remains recovered from below the ash layer at these two sites are still being studied and their relationship to Workman's Taye Lake materials is not yet clear.

In the southern Yukon the most recent or late prehistoric remains are easiest to identify by their stratigraphic position above the White River ash layer, thus post-dating AD700. Workman has called the post-ash prehistoric period in the southwest Yukon the Aishihik phase (1978). His research suggests that there is continuity between the Aishihik and preceding Taye Lake phases, as well as between the Aishihik and the early historic Bennett Lake phase, which implies that there has been 4500 years of continuity in occupation of that area (ibid.). At present we do not know enough about Southern Lakes prehistory to suggest that this may also be the case here, though it may well be so.

Currently, 46 sites or site components which stratigraphically date to the late prehistoric period have been recorded in the Southern Lakes area. Some or all of these remains may have been produced by the direct ancestors of the modern native populations. Unfortunately, at present this prehistoric period is not well known. The most obvious artefact type common to late prehistoric sites are small side or corner notched points, types which may have been used as arrowheads.

During the 1982 field season, prehistoric remains postdating the ash fall were excavated at the Annie Lake and Desquanga sites (Greer 1982). At Annie Lake, the late prehistoric artefact inventory consisted largely stone flakes and animal bones. Desquanga yielded a number of small lithic notched points (of various shapes) as well as stone flakes, fragments of bone tools and quantities of faunal remains. The collections from both of these sites are currently undergoing analysis by the author, and will be reported on in detail in the future. Study of these collections should improve our understanding of the late prehistoric period.

No sites which contain occupations dating to the proto or early historic periods have been investigated in any detail. Historic sites or site components are recognized by their lack of lithic tools, and the presence of metal items (of European origin), beads, glass, etc. A trade bead of possible Russian origin was collected at one site (JbUf-2) in the Teslin Lake area, which suggests that this site may have been occupied during protohistoric times.

5. Areas Surveyed for Sites

5.1. Previous Archaeological Work

In the years since it was first opened up with the construction of the Alaska Highway, a number of different researchers have recorded sites in the Southern Lakes district. The list includes D. Leechman, R.S. MacNeish, W.N. Irving, and R. Morlan. The early archaeology work was concentrated along the roadways, especially the Alaska Highway, and around the native communities of Carcross and Teslin. The north side of Carcross, for example, had long been known as a productive site area, and both archaeologists and amateurs have collected stone tools here. MacNeish (1964) mentions one site in the Annie Lake area as well.

Most of the sites recorded during the 1940s through 1960s consist of surface finds or badly disturbed sites. None were ever investigated in any detail. MacNeish may have tested some of the sites he found here in the 1950s, but his report (1964) pertains mostly to southwest Yukon archaeology and gives few details on the work completed in this area.

In the early 1970s the new Skagway road corridor was surveyed to identify sites which were or would be impacted by construction of that road. No sites were recorded along the segment of the road within the study area (Gates & Cassidy 1972).

In the late 1970s an inventory and assessment of sites along the Alaska Highway Natural Gas Pipeline corridor was completed. This work was done by Lifeways of Canada Ltd., an archaeological consulting firm based in Calgary (Reeves & Van Dyke 1978, Van Dyke 1979a, 1979b, 1980, Damp & Van Dyke 1982).

The proposed main pipeline route runs northwest - southeast across the study area, closely following the Alaska Highway. Both the main

and alternate routes such as the Ibex valley corridor and the Michee-Squanga Lakes corridor were checked for sites (ibid.). Along the pipeline corridor, survey efforts concentrated on locales such as stream crossings, lakeshores, etc., which are recognized to be of high archaeological potential.

Over one hundred and fifty sites were recorded along the pipeline route in the Southern Lakes district. Many of these were located along the Ibex valley segment of the corridor, though a number were found in other areas: the Takhini River valley, the Thirty-Seven Mile Creek valley, the Franklin Lakes area and the Squanga Lake area.

While most of the pipeline archaeology work was devoted to site identification and impact assessment, excavation for conservation purposes was undertaken at two sites in the Ibex valley (JeUv-36 and JeUu-3) in 1981 (Damp and Van Dyke 1982).

In 1980 the previously mentioned site inventory program sponsored by the Archaeological Survey of Canada and the Dept. of Renewable Resources of Y.T.G. was undertaken here. During the three month field season many locales, situated in various parts of the study area, were surveyed for sites. Our survey strategy was not random, but based on the researchers judgements on where sites may be located. The distribution of sites identified corresponds, more or less, with where we looked for sites.

Almost all of our work was concentrated in the low elevation areas. Logistical considerations greatly affected where we looked for sites. Due to a lack of suitable watercraft, not a great deal of survey work was conducted around the shores of the major lakes.

Areas examined for sites during that project included: shores of

Primrose and Rose Lake, junction of Little and Takhini Rivers, parts of the upper and lower reaches of Watson River valley, a section of Rose Creek valley, sections of the upper Wheaton River valley, areas around Alligator Lake, areas around Annie Lake, areas around Bonneville Lakes and Ibex Lake, the south and west shores of the Northwest and Windy Arms of Tagish Lake, sections of the east and west shores of Taku Arm of Tagish Lake, the north shore of Tagish Lake around Ten Mile Farm, sections of Tagish River, areas around the outlet of Marsh Lake, the areas around Snafu and Tarfu Lakes, around Seaforth and Teenah Lakes, various locales around Squanga Lake, and some sections of the shore of Teslin Lake. A few spot checks were also made at other locales in the study area.

In addition to the work conducted under this project in 1982, reported below, a few other sites have recently been recorded in the Whitehorse area. However, other than the two sites tested in the Ibex Valley and the two sites investigated during the 1982 field season of this project, none have been investigated in any detail.

5.2. Summary of 1982 Field Activities

The 1982 field season was devoted to both surveying for new sites and to testing the Annie Lake (JcUr-3) and Desquanga (JcUj-12) sites. A discussion of the activities and results of the site survey is given below. The excavations at Annie Lake and Desquanga will not be summarized herein as a detailed report on these sites is currently in preparation. However, it is worth noting that seventeen and one half and twelve square metres, respectively, were excavated at these two sites. A brief report on the excavation strategy and methodology, stratigraphy

and horizontal clustering, and the collections obtained from these sites can be found in the project field report (Greer 1982).

As previously mentioned, a survey program which sampled different environmental settings for sites could not be followed due to logistical constraints. Instead, it was decided to devote our survey time (approximately one month) to examining areas that were believed to be of high archaeological potential, particularly the shores of the major lakes and rivers where little site survey work had been undertaken. Ethnographic information on traditional land-use patterns (McClellan 1975) suggested that these areas would be of high archaeological potential.

Specific locales which were targeted for survey work in 1982 were: the lower sections of the McClintock and Nisutlin Rivers, the perimeter of Little Atlin Lake, the shores of Taku Arm of Tagish Lake, and the middle sections of the Wheaton River/Annie Lake valley area. A fibreglass canoe with motor, along with ground transportation, was used for access to these areas. A planned site survey trip on Tagish Lake with an elder of the Carcross Band had to be cancelled due to illness.

The field methods used in the site survey mainly included shovel testing of high potential areas and examination of erosional and surface exposures for signs of cultural deposits. All historic camps in the areas targeted for survey, excepting those on private property, were examined for sites. Test pits were dug until gravels were reached, except in the case of alluvial sediments, where erosional exposures were relied upon to expose buried materials. However, our survey efforts cannot be considered intensive in nature, as all areas traversed during our surveys were not tested in detail.

Once a site was recognized during our survey, efforts were directed

towards assessing the stratigraphic placement of the cultural materials and the horizontal extent of the site. Attempts were also made to detect any horizontal clustering of remains and to see if organic materials were preserved. Sketch maps were produced for only a few sites. All artefacts found in our tests pits as well as those on the site surface were collected as site samples.

Some survey work was completed in all of the abovementioned parts of the study area, excepting the Nisutlin River, where due to time contraints, no work was undertaken. Hopefully this potentially important area can be checked for sites in the near future. A few areas that had not been targeted for survey were examined for sites however.

A one day survey trip up the McClintock River did not record any prehistoric sites, to our surprise. More detailed investigation of this area may identify such remains, though it is possible that erosion has removed sites of any antiquity from the McClintock valley.

Six sites were recorded around Annie Lake in the Coast Mountains area. Another two sites were found not far away, beside the middle reaches of the Watson River valley. Survey work along Taku Arm and the main part of Tagish Lake identified five new sites, unfortunately only one of these appears to contain archaeological deposits of any value. Three new sites were recorded along the east side of Tagish River, but these too are not particularly noteworthy.

Four sites were recorded around the east end of Tarfu Lake, and four were found along the east side of Little Atlin Lake. One of the sites on Little Atlin Lake (JbUm-1, named the LuuCho site), is multicomponent, and appears to contain significant buried deposits. Two sites were found along the east side of Squanga Lake and another two found

along the north side of Squanga Narrows.

A brief summary of each of the sites recorded during the 1982 field season, including the site collections, is given in Appendix A of this report. Further details on these sites are available in the files of the Archaeological Survey of Canada, Ottawa.

6. Assessing Archaeologically Significant Areas

6.1. Introduction

Archaeological sites are a non-renewable resource. They represent the material remains of lifeways which are no longer in existence, and once sites are destroyed this information is lost forever. It is for this reason that the present project was originated. We need to know where sites are located in order to prevent their destruction with future development. Alternatively, if their destruction is unavoidable, sites should be properly excavated so that we can learn about the past from them.

Nearly five hundred sites have been identified in the Southern Lakes area. While a number of these are of no future concern since they have been entirely collected or destroyed, many sites here should be protected from future disturbance and destruction since they contain valuable information. However, though we know that these site locations should be protected since valuable archaeological resources are found there, the archaeological value of areas that haven't been surveyed remains uncertain.

In order to protect sites as best as possible and to use the financial resources for this purpose in the most productive manner possible, it would be useful to know what areas have a high potential of yielding archaeological materials. Hence the goal of the present project: to study the patterning in known site locations to see if this can be used to evaluate the archaeological significance of areas that have not yet been surveyed for sites.

In addition to providing potentially useful planning information, a study of site locations in the Southern Lakes provides an opportunity to

draw together the work of various archaeologists to show where sites had been looked for and where they had been recorded. It also offered a chance to study prehistoric land-use patterns in this area and to examine in what geological contexts sites have been preserved and found.

The method used in the evaluation of site locations is outlined in the next section. This is followed by a review of the results i.e., in what geological/geomorphological contexts sites have been found and then the limitations of the study. The final section of this chapter is a discussion of the geological context of the actual archaeological deposits, (as opposed to the site location) since it is believed that this information can be useful in assessing where sites may be located as well.

Before proceeding, a few points of clarification are in order. The sites used in this study are those in the files of the Archaeological Survey of Canada, Ottawa. They are listed by their identification or Borden number in Appendix B of this report. Their locations, as well as other details on them, are available in the A.S.C. site files. Ten sites in the A.S.C. files have not been used in this study because of inconsis-tencies in their locational information.

Almost all of these sites date to the prehistoric period, though a few early historic and multicomponent historic-prehistoric sites are included in the data base as well. Historic structures that are currently in use are not included in the archaeological files.

No attempt has been made to assess the current status or the value of any of the 483 sites used in this study. For some sites this information can be found in the site files of the A.S.C., while for others, particularly those sites identified a number of years ago, it cannot.

Some sites were entirely collected at the time they were recorded, and thus they are in no danger of being impacted in the future. As well, I believe a few of the sites have been more or less destroyed since they were identified. Therefore this site list should not be used alone as a site management tool.

6.2. Method Used in Study of Site Locations

The pattern of site locations was studied by examining the geological/geomorphological context of the sites. This dimension of the environment was chosen for study because detailed information on it was available. However, since field observations on the geological/geomorphological context of each site were not available, this information was derived from the terrain type on which a site was located. The terrain types (provisional) were taken from land units mapped by the Resource Inventory Program, Dept. of Renewable Resources, Y.T.G.

The method involved plotting the 483 sites on a series of seven maps (scale 1:100,000) for the study area which outlined land units of common soils and surficial geology. These unit boundaries were based on: First Soil Association Member, Second Soil Association Member (if recognized), Third Soil Association Member (if recognized), First Genetic Material and its surface expression, modifying processes and texture, Second Genetic Material (if recognized) and its surface expression, modifying processes and texture, and Third Genetic Material and its surface expression, modifying processes and texture (if recognized).

In the present analysis provisional terrain types rather than the foregoing complete land unit data were employed. These types were based upon the First Soil Association, the First Genetic Materials and the

Second Genetic Materials (if recognized), but not the surface expression, modifying processes and texture of these last two. A listing of the soil associations and genetic materials recognized in the study area is given below. Over 150 different provisional terrain types, that is, different combinations of the First Soil Association and First and Second Genetic Materials have been recognized here.

Table 1 Genetic Materials and Soil Associations Found in Study Area

A) Genetic Materials

- A Alluvium
- C Colluvium
- E Eolian Deposits
- G Glaciofluvial Deposits
- L Lacustrine Deposits
- M Morainal Deposits
- O Organic Deposits
- R Bedrock
- I Glacial Ice

B) Soil Associations

Ch1 Orthic Eutric Brunisol or Orthic Grey Luvisol, on Lacustrine Material
Ch2 Gleyed Humic Regosol or Orthic Melanic Brunisol, on Lacustrine Material
Ch3 Orthic Humic Gleysol or Rego Humic Gleysol, on Lacustrine Material
Ch4 Orthic Static Cryosol, on Lacustrine Material
Mb1 Orthic Eutric Brunisol, on Lacustrine and Morainal Complex
Mb2 Eluviated Eutric Brunisol, on Lacustrine and Morainal Complex
Mb3 Orthic Humic Gleysol or Rego Humic Gleysol, on Lacustrine and Morainal Complex
Cs1 Orthic Regosol, on Eolian Material
Cs2 Orthic Dystric Brunisol or Orthic Eutric Brunisol, on Eolian Material
Jd1 Orthic Eutric Brunisol or Orthic Dystric Brunisol on Glaciofluvial Material
Jd2 Eluviated Eutric Brunisol, on Glaciofluvial Material
Bb1 Orthic Eutric Brunisol or Orthic Dystric Brunisol, on Glaciofluvial and Morainal Complex
Bb2 Eluviated Eutric Brunisol or Eluviated Dystric Brunisol, on Glaciofluvial and Morainal Complex
Bb3 Orthic Gleysol or Orthic Humic Gleysol, on Glaciofluvial and Morainal Complex
St1 Orthic Eutric Brunisol or Orthic Dystric Brunisol, on Old Alluvium
St2 Eluviated Eutric Brunisol or Eluviated Dystric Brunisol, on Old Alluvium
Wt1 Rego Gleysol, on Recent Alluvium
Wt2 Orthic Humic Gleysol or Orthic Gleysol, on Recent Alluvium
Ns1 Rego Gleysol or Gleyed Regosol, on Alluvial and Organic Complex

cont'd.

Ns2 Terric Mesisol or Terric Mesic Organic Cryosol, on Alluvial and Organic Complex
Ws1 Orthic Eutric Brunisol or Orthic Dystric Brunisol, on Morainal Material
Ws2 Eluviated Eutric Brunisol or Eluviated Dystric Brunisol, on Morainal Material
Ws3 Orthic Humic Gleysol, on Morainal Material
Ws4 Orthic Turbic Crysosol, on Morainal Material
Gr1 Orthic Eutric Brunisol or Orthic Dystric Brunisol, on Morainal and Colluvial Complex
Gr2 Eluviated Eutric Brunisol or Eluviated Dystric Brunisol, on Morainal and Colluvial Complex
Gr3 Orthic Humic Gleysol, on Morainal and Colluvial Complex
Gr4 Orthic Turbic Cryosol, on Morainal and Colluvial Complex
Ca1 Orthic Eutric Brunisol or Orthic Dystric Brunisol, on Colluvium
Ca2 Eluviated Eutric Brunisol or Eluviated Dystric Brunisol, on Colluvium
Ca3 Orthic Regosol, on Colluvium
R Regosol, on Bedrock
Th Orthic Regosol or Regosolic Turbic Cryosol, on Neoglacial Morainal Material
Tn1 Terric Mesisol, on Organic Material
Tn2 Terric Mesic Fibrisol, on Organic Material

The surface area of the units mapped by the Dept. of Renewable Resources (and therefore the mapped individual terrain types) varies in size of course. They range from less than 1 square kilometre, in the case of an alluvial fan, to over 20 square kilometres, in the case of lacustrine plain areas situated southwest of Lake Laberge. Examples of common provisional terrain types in the Southern Lakes study area are:

R - R/C

where R (a Regosol) is the First Soil Assoication
R (Bedrock) is the First Genetic Material
C (Colluvium) is the Second Genetic Material

This type applies for example, to the rugged terrain of the Finger Mountain area in the Bennett Range situated immediately to the west of Bennett Lake. No sites were recorded on this terrain type. Another example of a terrain type is:

Wt2 - A/A

where Wt2 (a Orthic Humic Gleysol or a Orthic Gleysol) is the First Soil Association Member

A (Alluvium) is the First Genetic Material
A (Alluvium) is the Seond Genetic Material

This designator refers for example, to the modern floodplain and valley area along Judas Creek, east side of Marsh Lake. A third and fairly common example of a terrain type in the study area is:

Gr1 - M/C

where Gr1 (Orthic Eutric Brunisol or Orthic Dystric Brunisol) is the First Soil Association Member
M (Morainal deposits) is the First Genetic Material
C (Colluvium) is the Second Genetic Material

This terrain type, with a Brunisol soil type developed on morainal and colluvial deposits is common on the valley sides in the mid to low elevations of the study area. Sites have been found on this terrain type.

Examples of the full land unit designators, including the the Second and Third Soil Associations, and the surface expression, modifying processes and texture of the Genetic Materials, from which these terrain types were taken, can be found on the 1:100,000 scale Surface Geology and Soils maps at the Department of Renewable Resources, Y.T.G.

In the analysis of the site locations, the first step involved the plotting of sites on the land unit maps. After this, the terrain type (i.e., first soil association and first and second genetic material) was recorded for each site. Distance from the site to a river, creek or waterbody was also estimated for each site.

The terrain type data for each site was tabulated, and is discussed in the next section of this report. Since the data base employed in this study was not randomly derived, no statistical manipulations were undertaken with the results.

Information on the patterning in site location was portrayed gra-

phically on a set of maps for the study area (scale 1:100,000). On these maps, all land units on which sites were located and all other units of these same terrain types were shaded the same colour to indicate high archaeological potential. There was one exception to this procedure. In the case of terrain types on which only one site had been recorded in the entire study area, only the actual terrain unit on which the site was located was so coloured. All other units of this terrain type were shaded the same as terrain types on which no sites have (yet) been recorded. The latter areas indicate areas of low archaeological potential, based on our current knowledge of site distribution patterns.

A few select land areas which have been shaded as low archaeological potential (since no sites have been recorded on that terrain type) are considered to be of possible archaeological signficance for another reasons, i.e., ethnographic records of traditional land-use patterns. On the maps these locales have been hatched to indicate their possible archaeological significance.

Although it would have been desirable to undertake a detailed topographic analysis of the setting of each site, this was not possible since the sites had been recorded by various archaeologists and there was considerable variation in the quantity and quality of locational information that was available for any site. The project also did not have the necessary resources to relocate and revisit the sites to make such observations. It was also impossible to obtain this type of information from available air photos.

6.3. Site Location Patterns

According the data employed in the present study, site locations in the Southern Lakes district show some distinct patterns. These will be reviewed first by looking at the distribution of sites by terrain type, and then the distribution of sites by dominant soil type alone, and by genetic materials materials alone. Finally, the topographic position of sites will be reviewed.

However, before proceeding, it must be emphasized that the following information does not represent a true distribution of all sites in the area since the data base employed in this study was not derived from a random or stratified random sampling program. Archaeological survey was not undertaken on all terrain types, nor has equal time been spent surveying those terrain types that have been studied.

To a degree, the pattern of site distribution obtained by studying the locations of known sites is probably a reflection of where archaeologists have looked for sites. This information itself should be useful for future site assessments here.

As mentioned in chapter 5, archaeological site survey work has been concentrated in the valley bottom areas. This is reflected in the terrain type data, where those types which occur in the valleys have the most sites. More survey work in higher elevation areas is definitely needed.

The distribution of sites by terrain type is given in Table 2.

Table 2 Frequency of Sites by Terrain Type

Jd1 - G/	130 sites	27%
Jd1 - G/A	29 sites	6%
Ws1 - M/R	28 sites	6%
St1 - A/	27 sites	6%
Jd1 - G/A	24 sites	5%
Ch1 - L/	22 sites	5%
Mb1 - M/L	18 sites	4%
St1 - A/A	15 sites	3%
Mb1 - E/L	13 sites	3%
Ws1 - M/ , Bb1 - M/G, Mb2 - M/L	10 sites	2%
Jd2 - G/	9 sites	2%
Jd2 - G/A, Gr1 - M/C, Ch2 - L/ , Cs1 - E/ , Jd1 - E/G	8 sites	2%
Ch4 - L/ , Cs2 - E/	7 sites	1%
Bb1 - G/M, Ws2 - M/ , St2 - A/G	6 sites	1%
Bb2 - M/G, Ch1 - L/M, Wt2 - A/A, Wt2 - A/ , Ch1 - E/L	5 sites	1%
Ch2 - L/G, Ca1 - C/	4 sites	.8%
Bb2 - G/M, Ws2 - M/A, St2 - A/	3 sites	.6%
Mb1 - L/M, Mb2 - L/M, St1 - A/L, Wt2 - A/O, R - R/M	2 sites	.4%

One site was recorded on each of the following terrain types: Jd2 - G/L, Gr2 - M/C, Bb2 - M/ , Ws3 - M/O, Ch1 - L/G, Ch4 - L/A, Ch4 - L/O, Wt3 - A/O, Cs2 - E/L, Ch1 - E/G, Ca1 - C/A, Gr1 - C/M, Ca1 - R/C, and Tn2 - O/L.

This data shows that a significant proportion of the sites are situated on one particular terrain type, Jd1 - G/ , Glaciofluvial genetic materials with either Orthic Eutric or Orthic Dystric Brunisols. The coarse fragments in these genetic materials are gravels, while these soils are well if not rapidly drained, and sandy to sandy loam in texture. Many of the sites on this terrain type are situated at or near the edge of the land unit, e.g., along the edge of a glaciofluvial terrace, overlooking the modern river or creek.

This terrain type is found in the valley bottoms in both the U-shaped valleys of the Coast Mountains and the wider valleys in the Plateau region. Of the 140 sites located on the Jd1 - G/ terrain type

over 60 of these were recorded on the Glaciofluvial terraces in the Ibex valley.

The other terrain types on which a number of sites have been found are: Jd1 - G/A, which features Orthic Eutric or Dystric Brunisols on Glaciofluvial and Alluvial deposits; Ws1 - M/R, which features Orthic Eutric or Dystric Brunisols on Morainal and Bedrock materials; St1 - A/ which features Orthic Eutric or Dystric Brunisols on Glaciofluvial and Lacustrine materials; and Ch1 - L/ , which features Orthic Eutric Brunisols or Orthic Grey Luvisols on Lacustrine deposits.

The fact that most of the terrain types on which sites have been found are located in the valley bottoms is not surprising since this is where archaeological survey work has been concentrated. This situation is also reflected graphically on the maps which depict archaeologically significant areas. On these maps the higher elevation parts of the Southern Lakes, such as the Coast Mountains and individual mountains and mountain chains in the Plateau region, are designated as low archaeological potential, while the valley bottom areas are designated as high archaeological potential. More survey work must be completed in the highland areas so their archaeological importance can be better evaluated.

Regardless of the true representativeness of the foregoing site distribution data by terrain type, the high frequency of sites on terrain type Jd1 - G/ suggests that where this type (glaciofluvial deposits, with either Orthic Eutric or Dystric Brunisol soils) occurs, sites may be located.

In order to see if the existing site location data could be more easily understood, the components of a terrain type, that is, the soil

associations and first and second genetic materials, were separately examined for site frequency. The soils data is presented in Table 3.

Table 3 Frequency of Sites by Dominant Soil Type

	Sites #	%
Brunisols (81%)		
Orthic Eutric Brunisol and/or Orthic Dystric Brunisol	345	71
Eluviated Eutric Brun. and/or Eluviated Dystric Brun.	49	10
Gleysols (3%)		
Orthic Humic Gleysol and/or Orthic Gleysol	13	3
Rego Gleysol	0	0
Regosols (2%)		
Orthic Regosol	8	1.6
Regosol	2	.4
Cryosols (2%)		
Orthic Static Cryosol and/or Orthic Turbic Cryosol	9	2
Regosolic Turbic Cryosol	0	0
Organics (.2%)		
Terric Mesic Fibrisol	1	.2
Terric Mesisol and/or Terric Mesic Organic Cryosol	0	0
Mixed		
Orthic Eutric Brunisol and/or Orthic Grey Luvisol	34	7
Gleyed Humic Regosol and/or Orthic Melanic Brunisol	12	2

Eighty-one percent of the sites are located on terrain types whose dominant soil type are either Eutric Brunisols, which are base, or Dystric Brunisols, which are slightly acidic (Clayton, Ehrlich, Cann, Day & Marshall 1977). The eluviated or degraded brunisols feature an Ae horizon while the orthic brunisols do not. Although Brunisols are generally well drained, orthic are better drained than dystric.

Given that all archaeological survey efforts are conducted in the summer months when poorly drained areas would be very wet, and hence difficult if not impossible to find sites in, it is not surprising that recorded sites are associated with Brunisol profiles.

I believe the best indicator of patterning in the geological/geomorphological context of sites is the genetic materials on which they have been found. This parameter provides the same degree of useful

information are the terrain type, but in a simpler, clearer manner. This is understandable since parent material is major influence on the type of soil development (as shown in the soil associations). The data on frequency of sites by genetic materials (both first and second) is depicted in Table 4.

Table 4 Frequency of Sites by Genetic Materials

Glaciofluvial Materials	209 sites	43%
Lacustrine Material	55	11%
Old Alluvium	53	11%
Morainal Material	48	9%
Lacustrine and Morainal Complex	45	9%
Glaciofluvial and Morainal Complex	25	5%
Eolian Material	16	3%
Recent Alluvium	13	2%
Morainal and Colluvial Complex	10	2%
Colluvium	6	1%
Bedrock	2	.4%
Organic Material	1	.2%
Alluvial and Organic Complex	0	0%
Neoglacial Morainal Material	0	0%

Again, regardless of the predictive ability of the above data, the high frequency of sites on Glaciofluvial materials suggests that these areas should generally be considered to have high archaeological potential.

In this mountainous terrain these glaciofluvial deposits line the valley bottoms, except where they have been eroded and cut by more recent fluvial activity. Their well drained and comparatively smooth surfaces provide excellent landforms to travel on by foot, a pleasant change from heavily forested and bog areas. Therefore it is not surprising that they were frequently used in prehistoric times.

The foregoing data on site distribution patterns was used to produce maps depicting archaeologically significant areas. Terrain types on which sites have been found were shaded to indicate high archaeological potential, while those types on which sites had not (yet)

been found were shaded to indicate low archaeological potential. These maps are on file at the Department of Renewable Resources, Y.T.G.

The maps depicting archaeologically significant areas are, I believe, of limited utility for planning purposes. Large land areas are shaded to indicate high archaeological potential, when in fact only a small part of such an area may have sites on it. As a result, the maps are likely too inaccurate for predicting the archaeological significance of any specific locale in the study area.

There are two main reasons that these maps are of limited predictive value. First, a program of stratified random sampling of the various terrain units for sites was not undertaken. Second, the terrain type does not appear to be a suitable unit of analysis since it represents an larger area of landscape homogeneity, when it fact, sites appear to be situated in smaller and topographically distinct locations (see below).

Though the maps should not be used alone to assess the archaeological potential of any particular part of the Southern Lakes area, they have some value nonetheless. The approximate locations of the known sites have been indicated on them and they do depict graphically the terrain types on which sites are known.

In the process of recording the terrain types on which sites were located, observations were also made on the topographic position of the sites. In this regard the Southern Lakes sites display two distinct, and I believe quite important patterns: the sites are situated close to waterbodies and in topographically distinct locales. These factors will be briefly discussed.

The sites tend to be located close to a river, creek or lake.

Eighty-seven percent of the sites recorded here are situated either beside or within one half kilometre of a waterbody.

In spite of the fact that archaeological survey efforts have been concentrated around these features, I believe that this may be true site distribution pattern, for a number of reasons. Perhaps one of the more obvious ones is that in mountainous terrain such as that of the Southern Lakes area, in the valley bottoms you are never far from a waterbody. However, there are likely many reasons why prehistoric peoples chose to camp close to lakes, river and streams. Certainly access to good fishing spots and abundant drinking and washing water may have been some of them, but we must also consider that lakes and rivers also are likely good areas to see and track game. As well, when frozen, the major lakes here are natural routes of transportation.

Looking at the types of waterbodies which sites are situated close to also provides some useful information. This is shown in Table 5 which gives the number of sites by waterbody type.

Table 5 Frequency of Sites by Closest Waterbody

Major Lake (Bennett, Tagish, Marsh, Lebarge, Little Atlin, Teslin)	83 sites	17%
Medium Lakes (greater than 1 square km, excl. the above lakes)	117	24%
Small Lakes (less than 1 square km)	42	9%
Rivers	88	18%
Creeks & Tributaries	153	32%

It is not known if this reflects a true distribution of sites or what is more likely the time spent surveying around the different types of waterbodies. It is possible that the low frequency of sites on the shores of the major lakes may indicate that many sites in these settings have been destroyed or eroded away by the strong wave activity which occurs on these waterbodies. For example, a group of sites identified

along the north shore of Tagish Lake was found to be almost entirely eroded away. As well, along those sections of the shore of Teslin Lake that I surveyed in 1980, surprisingly few sites were found, while driftwood was often seen on beach lines several metres above the summer water level, an indicator of how active that particular lake is. Further work is needed around the lakeshores here to see if natural erosional processes are removing valuable archaeological resources.

The second distinct pattern of site topographic location that was noted is that sites are located either at the edge of a terrain unit or at the junction of a terrain unit and a waterbody. Sites are not situated in the middle of a terrain type, but at its edge, in topographically distinct situations e.g., along the edge of a glaciofluvial terrace, on the edge of old alluvial terrace, where a glaciofluvial ridge meets a waterbody, on a bedrock outcrop beside a lakeshore, the corner terrace of a high ancient beachline, etc. It is not surprising that sites tend to be situated in topographically distinct areas, since such locales provide better views of the surrounding landscape.

Unfortunately, this site topographic information could not be incorporated into the interpretive data base used to produce the maps showing archaeologically significant areas because of the scale at which these maps were produced. However, I believe this information must be considered when evaluating the archaeological significance of any particular part of this region.

To summarize, based on our current understanding of site locations, it appears that well drained locales situated close to or beside rivers, creeks and lakes, and/or near the junction of different terrain units are of archaeological significance. In terms of the geological/geomor-

phological data, I do not believe that terrain types alone i.e., the combination of soil associations and genetic materials, are very useful for predicting archaeologically significant areas. Genetic materials by themselves appear to demonstrate the same information that the terrain types do, but in a simpler and clearer manner. Due to the great number of sites identified on glaciofluvial materials, it is suggested that archaeological sites may be common on this parent material.

Though sites are known to be associated with the well drained Brunisol soils, further survey work in areas of other soil types, and of course the genetic materials on which other soil types are found, is needed to better evaluate the accuracy of this pattern.

6.4. Context of the Actual Archaeological Deposits

In this section, the geological context of the actual sediment deposits in which archaeological finds have been made will be reviewed and the implications of these patterns will be discussed.

It is important to note that for most of the genetic materials on which sites have been recorded e.g., Lacustrine deposits, Old Alluvium, Morainal deposits, Glaciofluvial deposits, Colluvium, and of course Bedrock, the archaeological deposits do not lie within the deposits of the parent materials themselves. The archaeological materials have been recovered either above or on the surface of these deposits, or within the discontinuous eolian sediments which commonly overlie these genetic materials. Although no sites have been found within any of the aforementioned genetic materials, nor are any anticipated, if some were found they could be of considerable antiquity.

Since archaeological materials in the Southern Lakes area are most

likely postglacial in age, they are apt to be buried within deposits that are either eolian, alluvial or colluvial in origin, because wind, moving water and gravity have been the major means by which sediments have been moved and the landscape modified in postglacial times.

Sites could also possibly be found within lacustrine sediments. However, since there has been little change in lake levels once they stabilized after deglaciation, extensive Holocene-aged lacustrine sediments are not common here, unlike the Kluane area (Johnson and Raup 1964). In the highland areas, it is possible that archaeological materials could be found within neoglacial deposits, though none are known. Neither of these last two sediment types are considered to be of high archaeological potential.

The geological origin of the sediments within which archaeological materials are buried determines many things, but the two most important of these are whether the site is preserved and whether it is discoverable by the archaeologists. The implications of the different geological contexts of sites in the study area will be reviewed here.

Where eolian sediments are deep, archaeological materials buried within them could be well below the modern land surface, and quite difficult to detect. However, some of the oldest archaeological materials may be found in these sediments since the greatest deposition of eolian materials (loess) occurred in early postglacial times. Areas of relatively deep eolian sediments, overlying parent materials of lacustrine, morainal, glaciofluvial or alluvial deposits do occur in the Southern Lakes district, in the lower Watson River valley, the Takhini River valley, and the Yukon valley for example.

It is worth noting that two sites recorded in 1980 in the lower Watson River valley appeared to buried in loess sediments. The lithic debitage collected from one of these sites (JbUq-16) appeared to be technologically quite distinct and may be of some antiquity. Unfortunately, when discovered by the archaeologist these two sites were completely destroyed (by railway or railway pipeline construction), and the artefacts were recovered from bulldozer dumped sediment piles. No intact buried deposits were detected in the surrounding areas.

Due to the instability of sand dunes, archaeological sites buried within these eolian sediments do not tend to be particularly well preserved. This would appear to be the case for many of the finds around the settlement of Carcross, where sites have been exposed, deflated, and reburied, perhaps many, many times. This situation means that prehistoric materials of various ages could be mixed together in one site. It is difficult for the archaeologist to record and to assess finds in these areas.

Where the eolian sediments are shallower, e.g., only a few centimetres, archaeological deposits can be more easily identified. Often in these situations, the artefacts lie directly upon the parent materials, such as glaciofluvial gravels or bedrock. Frequently they can be discovered by fairly shallow test pits if buried only a few centimetres below the surface. For example, the Annie Lake site (JcUr-3) was discovered when artefacts were seen on the trampled ground surface of a footpath. When tested in detail, however, this same site yielded artefacts buried in eolian sediments up to 45cm deep, overtop of the parent glaciofluvial materials.

Due to the relatively great speed by which alluvium can be depo-

sited, archaeological materials in these sediments can be buried well below the modern land surface. In these topographic situations, sites can be best recognized by examining erosional exposures along the river or creek bank. However, the periodic flooding of the river may have conveniently separated the various prehistoric occupations of the site by sterile silt layers, a situation which greatly improves the archaeologist's ability to interpret the site.

Unfortunately, this same geological context which sees sites well buried often sees them quickly eroded away and lost forever by the meandering river. In the Southern Lakes study area the McClintock and Nisutlin Rivers meander extensively, and survey work on the former recorded no prehistoric materials though they were anticipated from ethnographic information. More intensive investigation of the lower McClintock may change this situation however. To date, almost no archaeological work has been completed on the Nisutlin so it is not known if archaeological sites here are being eroded away.

Finally, although a few sites have been recorded on terrain types which feature colluvial deposits, I do not believe that any of the archaeological materials occur within the colluvium itself. They are most likely on top of or within a thin aeolian blanket which lies over older, more stable colluvial deposits. Due to the highly active and unstable nature of more recent colluvium it is probable that if sites had been located there they would not be preserved.

In summary, I hope that all future survey or site impact assessment studies will pay particular attention to the sediment context of archaeological materials, so that we can continue to learn in what context sites are preserved and discovered here. Work in the areas of recent

alluvial sediments, especially the Nisutlin River valley, is badly needed. I also suggest that we closely watch all roadcuts and construction activity in those areas with deep eolian sediments so that more ancient prehistoric remains might be recognized, hopefully before they are completely destroyed.

7. Summary and Conclusions

This project has been a study of site locations in the Southern Lakes District of Yukon Territory. The geological/geomporholoical context of 483 sites has been reviewed to see if there is patterning the locations of the known sites, patterning that might be useful in assessing archaeologically significant areas in this region.

The available site data suggests that sites tend to be located close to or beside waterbodies (lakes, rivers and creek) and on the edges of terrain units, in locales that are topographically distinct.

Study of the geological/geomorphological context of the sites shows that the greatest number has been found on glaciofluvial parent materials, though many have also been recorded on lacustrine materials, old alluvium, morainal materials, complexes of lacustrine and morainal materials, and complexes of glaciofluvial and morainal materials. While fewer sites are recorded on eolian parent materials, I believe areas of these deposits are likely of high site potential as well. Some sites have also been found on areas of recent alluvium, though these deposits nave not been extensively surveyed for sites.

Very few sites are known where the parent materials are either bedrock or colluvium. While this could be the result of a lack of site survey in such areas, especially the high elevation parts of the study area, it is more likely representative of the true pattern of site distribution. People would not have been able to camp on the rugged, steep, bedrock and colluvial slopes which are most common in the mountainous parts of the study area.

Sites tend to be associated with areas where Brunisol soils, particularly the Orthic Brunisols (both Eutric and Dystric), are

dominant, though a number are associated with Eluviated Brunisols as well. A few sites were found to be associated with Gleysols and Cryosols.

The distribution of sites by terrain type, i.e., soil association and genetic materials, was used to create maps showing archaeologically significant areas. On these maps individual terrain units on which sites have been located and those terrain units that are the same types as those on which sites have been recorded were similarly shaded to indiciate high archaeological potential. Terrain units on which sites have not (yet) been located were shaded to indicate low archaeological potential, based on our current knowledge of site distribution patterns.

For a number of reasons, I believe the resulting maps (on file, Dept. of Renewable Resources, Yukon Government) are too inaccurate to predict the archaeological significance of any particular locale in the study area. These maps do however, show the general location of the sites currently on file.

Perhaps a better use of the existing site location data would be in the assessment of the archaeological potential of individual locales here, as required in future impact assessments, rather than the production of archaeological sensitivity maps for the study area as a whole. To do this, the genetic materials and the topography of a potentially impacted area could be assessed by directly studying the soils and surficial geology maps currently being prepared by the Dept. of Renewable Resources, Yukon Government. In this manner, high potential areas, e.g., the edges of terrain units or where terrain units meet waterbodies, could be more easily located, even on the genetic materials on which they appear to occur in low frequency i.e., colluvium, recent

alluvium, bedrock, organic materials.

The present study has focused on geological/geomorphological context of site locations. However, consideration of the origin of the sediments within which the archaeological remains themselves may be found also provides some information which is useful for understanding potential site locations. Archaeological sites are most likely to be found within the eolian sediments which cap the various genetic materials in this area, or within eolian, recent alluvium, or colluvium parent materials themselves. The types of sediments within which sites may be buried must be taken into account in establishing the research design for future site surveys.

While the site location patterns reviewed in this report may not be representative of the true distribution of all sites in this area, they nonetheless demonstrate that certain topographic settings (boundaries of terrain units and edges of waterbodies) and certain genetic materials (glaciofluvial deposits in particular) and certain soil types (the Orthic Brunisols) do yield sites.

To conclude, from the site data currently available, we know that significant archaeological resources exist in the Southern Lakes area. Given that only a small proportion of this region has been surveyed for sites, it is likely that many more valuable sites will be found here. It is hoped that the foregoing review of existing site location data can be of some help in delineating other areas of archaeological significance here.

References Cited

Bostock, H.
1948 Physiography of the Canadian Cordillera with special reference to the area north of the fifty-fifth parallel. Geological Survey of Canada, Memoir 247. Ottawa.

Clayton, J.S., W.A. Ehrlich, D.B. Cann, J.H. Day & I.B. Marshall
1977 Soils of Canada. Dept. of Agriculture, Ottawa.

Damp, J. & S. Van Dyke
1982 Final Report Conservation Mitigation Alaska Highway Gas Pipeline Project Foothills Pipe Lines (South Yukon) Limited. Calgary, Lifeways of Canada Ltd.

Gates, M. & S. Cassidy
1972 Archaeological survey of the Carcross to Skagway highway route. ms on file Archaeological Sites Advisory Board, Government of British Columbia, Victoria.

Government of Yukon
1979 Proceedings: resource inventory workshop, Yukon Territory. Whitehorse, Yukon.

Greer, S.
1981 Archaeological survey in the Southern Lakes district, Yukon Territory, 1980, final report. ms on file, Archaeological Survey of Canada, National Museums, Ottawa.

Greer, S.
1982 Field Report of the 1982 Scuthern Lakes (Yukon) Archaeology Project. ms on file Archaeological Survey of Canada, National Museums, Ottawa.

Greer, S.
1982a Research Proposal: Late prehistoric land-use patterns in the Southern Lakes district, Yukon Territory. ms on file, Archaeological Survey of Canada, National Museums, Ottawa.

Hughes, O.L., R.B. Campbell, J.E. Muller, & J.O. Wheeler
1969 Glacial limits and flow patterns, Yukon Territory, south of 65 degrees north latitude. Dept. of Energy, Mines and Resources, Geological Survey of Canada, Paper 68-34.

Johnson, F. & H.M. Raup,
1964 Investigations in southwest Yukon: geobotanical and archaeological reconnaissance. Papers of the Robert S. Peabody Foundation for Archaeology #6-1: 1-198. Andover, Mass., Phillips Academy.

Lerbekmo, J.F., J.A. Westgate, D.G.W. Smith & G.H. Denton
1975 New data on the character and history of the White River volcanic eruption, Alaska. In Quaternary studies, ed. by R.P. Suggate & M.M. Cresswell. Wellington, Royal Society of New Zealand.

McClellan, C.
1964 Culture contacts in the early historic period in northwestern North America. Arctic Anthropology 2-2: 3-15.

McClellan, C.
1975 My old people say: an ethnographic survey of southern Yukon Territory. National Museums of Canada, Publications in Ethnology, #6. 2 volumes. Ottawa.

MacNeish, R.S.
1964 Investigations in the southwest Yukon: archaeological excavation, comparison and speculations. Papers of the R.S. Peabody Foundation for Archaeology # 6-2: 201-488. Andover, Mass., Phillips Academy.

Miller, M.M. & J.H. Anderson
1974 Out-of-phase Holocene climatic trends in the maritime and continental sectors of the Alaska-Canada Boundary Range. In Quaternary environments: proceedings of a symposium. ed. by W.C. Mahaney. York University, Geographical Monographs #5: 33-58.

Mulligan, R.
1963 Geology of the Teslin map-area, Yukon Territory (105C). Dept. of Mines and Technical Surveys, Geological Survey of Canada, Memoir 326.

Oswald, E.T. & J.P. Senyk
1977 Ecoregions of Yukon Territory. Fisheries and Environment Canada, Victoria.

Reeves, B.O.K. & S. Van Dyke
1978 Historical site reconnaissance (1977), Alaska Highway Gas Pipeline. Two volumes. Lifeways of Canada Ltd., Calgary.

Schwatka, F.
1885 Report of a military reconnaissance in Alaska made in 1883. Washington, D.C.

Sidney, A.
1980 Place names of the Tagish region, southern Yukon. Yukon Native Languages Project, Council for Yukon Indians. Whitehorse.

Sidney, A.
1982 Tagish Tlaagu. Tagish stories. Council for Yukon Indians and Government of Yukon, Whitehorse.

Teslin Women's Institute,
1972 A history of the settlement of Teslin, Yukon Territory. no publisher.

Theberge, J.B., J.G. Nelson & T. Fenge
1980 Environmentally significant areas of the Yukon Territory. Canadian Arctic Resources Committee, Ottawa.

Van Dyke, S.
1979a Environmental statement - historical resources - Alaska Highway Oil Pipeline. Lifeways of Canada Ltd., Calgary.

Van Dyke, S.
1979b Archaeological studies, Alaska Highway Gas Pipeline Project, summary report of the 1977-78 studies. Lifeways of Canada Ltd., Calgary.

Van Dyke, S.
1980 Archaeological inventory, Alaska Highway Pipeline Project, Yukon Territory, Alignment Studies 1980. Lifeways of Canada Ltd., Calgary.

Wheeler, J.O.
1961 Whitehorse map-area, Yukon Territory, 105D. Dept. of Mines and Technical Surveys, Geol. Survey of Canada, Memoir 312.

Workman, W.B.
1974 First dated traces of early Holocene man in the southwest Yukon Territory, Canada. Arctic Anthropology XI, Supplement, 94-103.

Workman, W.B.
1978 Prehistory of the Aishihik-Kluane area, southwest Yukon Territory. National Museum of Man Mercury Series, Archaeological Survey of Canada, Paper #74. Ottawa.

Wright, A.
1976 Prelude to Bonanza. Sidney, B.C., Gray's Publishing Ltd.

Yukon Historical and Museums Association
n.d. Whitehorse walking tour. ms on file, Territorial Archives, Whitehorse.

Yukon Historical and Museums Association
1980 Documentation of Historic Buildings in Carcross Yukon. ms on file, Territorial Archives, Whitehorse.

Appendix A

Summary of Sites Recorded in 1982 Field Season

Further details on these sites on file, Archaeological Survey of Canada, Otttawa.

JaUk-20, Tarfu Lake

A multicomponent site with prehistoric and historic period remains. Complexity of prehistoric occupations is unknown, no vertical stratigraphy detected in the site, though horizontal stratigraphy is apparent. Different areas of the site recognized: Area A, top of lookout knoll, where flakes of different sizes and raw materials, tiny bone fragments, and a small sidenotched point collected from surface context, no buried deposits detected; Area B, small eroding hearth area with associated retouch size lithic detritus; Area C, surface and buried scatter of bone and historic period debris, e.g., metal, leather, none of this stuff collected, likely the remains of a trapping camp.

Collection summary: small sidenotched point (incomplete); 15 flakes including biface trimming flakes, with and without platforms, various sizes, lithic remains made of grey cherts; faunal remains, only that associated with historic occupation is identifiable, remainder is unidentifiable to species.

JaUk-21, Tarfu Lake

A prehistoric site whose complexity is unknown. A small area of buried deposits found on lower bench (Area A) is post-ash in age. Scattered surface finds collected from top of high, lookout type knoll (Area B) as well.

Collection summary: 23 shaping and trimming flakes, with and without platforms, of various sizes, made of grey, green and black cherts, plus one piece of possible green slate.

JaUk-22, Tarfu Lake

A multicomponent prehistoric site which, however, is badly disturbed by natural erosion, deflation processes. Materials collected from both surface and buried (below the volcanic ash layer) contexts. One deflated hearth area seen on surface above the ash layer, and another with finely mashed bone fragments found eroding from beneath the ash layer in another part of site.

Collections summary: fragments of two edge retouched flakes; 3 pieces of a smashed chert cobble; 5 flakes, including one biface trimming flake, with and without platforms, of various sizes; 3 chert types and 1 obsidian represented in lithic assemblage; bone, not analyzed (but all mammalian, and likely unidentifiable to species), well calcined or charred.

JaUk-23, Tarfu Lake

A prehistoric site which appears to be a small, perhaps single occupation, camp which is post-ash in age. Two hearth areas are partly exposed on surface. Flakes and bone were collected from surface and test pits dug in area of hearths. Intact buried deposits exist.

Collections summary: one bipolar flake or piece esquillee; 2 thick flakes or chunks; one small flake without platform; lithic remains made of obsidian and chert; bone, 20 small fragments, unidentifiable mammal bone, charred and/or calcined.

JbUl-1 Little Atlin Lake

A small site on bedrock knob beside lake which has been badly disturbed by recent use of locale as a camping spot. Some flakes found in buried context, but very little of value remains.

Collection summary: one rotated core or rough biface fragment; 10 flakes including biface trimming and cortex flakes, with and without platforms, of various sizes; lithic remains made of grey and black cherts; one tiny fragment of carved bone; 13 small bone fragments, unidentifiable mammal, charred or calcined.

JbUl-2 Little Atlin Lake

A site which has largely been eroded into lake. Two eroding hearth areas found some distance apart, little remains of these. Artefacts collected on surface around these hearth areas.

Collection summary: small fragment of tabular spall (chi-tho) scraper; 2 small biface trimming flakes of grey chert; 1 tiny bone fragment, unidentifiable to species.

JbUm-1 The LuuCho Site Little Atlin Lake

A multicomponent prehistoric site with good stratigraphy and extensive intact buried deposits. At least two stratigraphically distinct post-ash occupations may be present here, as well as remains which pre-date the ash fall. Various hearth or hearth-related midden type deposits encountered in testing. Testing of the site was not completed in 1982, and more work is planned to further assess the deposits.

Summary of 1982 Collection: biface fragment, tabular spall scraper, tabular spall scraper fragment, pebble core, shell bead, shell fragment, 9 fragments of worked bone, and an estimated 150 stone flakes; the lithic remains are made of various cherts and obsidian; bone remains, several hundred whole and fragmentary specimens, not yet analyzed, but mostly mammalian species.

JbUm-2, Little Atlin Lake

A prehistoric site situated close to a historic native cemetary. Artefacts were collected from surface of roadtrail which runs through area. Extent of site and condition of deposits is not known as no subsurface testing was undertaken.

Collection Summary: One wedge or piece esquillee and 2 small flakes, all of grey or black chert.

JbUn-13, Tagish Lake

A small prehistoric site situated on bedrock knob beside lakeshore. Flakes found on surface, no buried deposits found anywhere in area. Site has likely been entirely collected.

Collection Summary: 2 small flakes, both without platforms, of the same grey chert.

JbUn-14, Tagish Lake

A small prehistoric site, likely single component. 4 fragments of one tool found in single test pit below the ash layer. A small area of intact buried deposits exists.

Collection Summary: 4 flake spalls which fit together to form one complete edge retouched flake specimen, made of grey/green chert.

JbUn-15, Tagish Lake

A small prehistoric site which has largely been eroded into lake. Materials collected from two areas, a hearth recognized at one of these. Little remains of site.

Collection Summary: 2 small flakes, one with and one without platform, made of grey chert; 4 small bone fragments, unidentifiable to species, burnt and calcined.

JbUn-16, Tagish Lake

A small prehistoric site which likely post-dates the ash fall. Flakes recovered from only one test pit, buried in and above the ash layer. A small area of buried deposits remains.

Collection Summary: 21 flakes, including biface trimming flakes, with and without platforms, of various sizes, all of same blue/grey chert.

JbUn-17, Tagish Lake

A small prehistoric site which appears to be largely disturbed and destroyed. One flake found on surface of clearing, all test pits in area were sterile.

Collection Summary: one small flake, with platform, made of dark grey chert.

JbUn-18, Tagish River

A small prehistoric site which predates the ash fall. Testing revealed a hearth area below the ash layer. Buried deposits appear to extend over only a few square metres. They are partly disturbed by ground squirrel burrowing.

Collection Summary: 3 small flakes, with and without platforms, made of grey cherts; one fire-cracked rock fragment; 28 small bone fragments, unidentifiable mammal species, burnt and calcined.

JbUn-19, Tagish River

A prehistoric site which has been almost entirely eroded into river. Materials were collected from above the ash layer, associated with a hearth area.

Collection Summary: 1 small flake, with platform, made of green chert; 8 small bone fragments, unidentifiable mammal species (large sized), burnt.

JbUn-20, Tagish River

A small prehistoric site which appears to be single component and post-ash in age. Hearth area partly exposed on surface. Disturbed by roadtrail which runs over site. A small area of intact buried deposits exists.

Collection Summary: 1 small retouched flake of streaked grey chert; 16 small bone fragments, unidentifiable mammal species, burnt.

JbUr-18, Annie Lake

A small prehistoric site which appears to be post-ash in age. Its complexity is unknown. Flakes were found on surface disturbed by tree-throw, above ash layer. Shallow, though intact, buried deposits present in site area.

Collection Summary: 22 medium and small sized flakes, including some bifacial trimming specimens and one ridge flake, with and without platforms; several different raw materials are represented in lithic debris: two grey cherts, two obsidians, and ignimbrite.

JbUr-19, Annie Lake

A prehistoric site of unknown complexity which has been entirely destroyed by bulldozer activity. All remains found on disturbed surfaces, no intact buried deposits found.

Collection Summary: 1 tongue-shaped, well-used, obsidian end scraper; 1 wedge or piece esquillee with four irregular sides and lozenge-shaped cross-section, made of light grey/green chert; 15 small flakes including biface trimming specimens and one flake fragment with a small section of edge retouch or damage, made of various cherts.

JcUj-15, Squanga Lake

A multicomponent prehistoric site with both pre- and post-ash remains. Artefacts recovered from buried context. Bone found below the ash layer. Intact buried deposits exist. May be a lookout, since there is good view up and down lake from the site.

Collection Summary: 16 flakes including biface trimming flakes and shatter fragments, of various sizes, made of black, brown and grey cherts and 1 obsidian piece; 5 small bone fragments, unidentifiable mammal species, burnt.

JcUj-16, Squanga Lake

A small multicomponent prehistoric site with both pre- and post-ash remains. Artefacts recovered in buried context. Bone found above the ash layer. A small area of intact buried deposits remains.

Collection Summary: 3 small flakes, includes 1 biface trimming flake, with and without platforms, made of three different materials: obsidian, grey chert, black chert; 10 small bone fragments, unidentifiable to species, calcined.

JcUk-10, Squanga Narrows

A multicomponent prehistoric site, with both pre- and post-ash remains, in at least three horizontal clusters. Intact buried deposits were found in test pits on ridge top area and in two large natural depressions which exist here. Further testing is required to better assess stratigraphy and extent of deposits.

Collection Summary: 1 biface fragment (large knife-like specimen); 1 unifacially edge retouched ridge flake; 10 flakes of various sizes, with and without platforms; lithic specimens are made of grey cherts and one each of obsidian and quartzite; 69 small bone fragments, not analyzed (most are unidentifiable to species, a few are medium or large sized mammals), burnt and calcined.

JcUk-11, Squanga Narrows

A small prehistoric site which predates the ash fall. Artefacts were recovered from buried context in test pits. Some intact, buried deposits remains.

Collection Summary: 6 small flakes, including one bifacial trimming flake, with and without platforms, made of two different grey cherts; 19 small bone fragments, unidentifiable to species, burnt and calcined.

JcUr-6, Annie Lake

A small prehistoric site which has been largely destroyed by cabin construction. Some intact deposits may lie beneath the cabin. Artefacts were collected on the surface around a disturbed hearth area. The site may have been a lookout for site JcUr-3, the Annie Lake site, which is situated only a short distance away.

Collection Summary: 4 small flakes, including one bifacial trimming flake and one blocky piece of quartz crystal, with and without platforms, rest are made of grey chert; 63 small bone fragments, not analyzed (most are unidentifiable to species, includes remains of large and small sized mammal species), burnt and calcined.

JcUr-7, Watson River Valley

A small prehistoric site which post-dates the ash fall and appears to be single component. Artefacts were collected around hearth area exposed on disturbed surface of roadtrail. Some intact buried deposits exist.

Collection Summary: 15 small flakes including some bifacial trimming specimens, with and without platforms; lithic debris made of 1 obsidian and 2 grey chert types; 5 small bone fragments, unidentifiable to species, burnt and calcined.

JcUr-8, Watson River Valley

A prehistoric site which has been almost entirely destroyed by bulldozer activity. Artefacts were collected from disturbed surface, and testing encountered no intact buried deposits.

Collection Summary: 4 flakes, including some bifacial trimming-/thinning specimens, with and without platforms, of various sizes, made of obsidian and grey chert.

JcUs-2, Annie Lake Area

A prehistoric site which has been almost entirely destroyed by wind erosion as well as disturbance by vehicular traffic. Artefacts were collected from disturbed surface context. No intact deposits were found, though more artefacts may exist in site area.

Collection Summary: 9 small retouch flakes, including some bifacial trimming flakes, with and without platforms, made of 2 or 3 varieties of grey chert.

JcUs-3, Annie Lake Area

A prehistoric site of unknown complexity found in active dune area. Site area has been badly disturbed by wind activity. Artefacts were collected from surface and shallowly buried contexts.

Collection Summary: 3 fragments of smashed cobble of poor quality chert and 17 flakes and shatter of same poor quality grey chert; one large flake, with platform, made of good quality grey chert.

JcUs-4, Annie Lake Area

A multicomponent prehistoric site with prehistoric remains found both above and below the ash layer. More than one pre-ash occupation may be present since in one test pit flakes were encountered at two depths below the ash. Horizontal stratigraphy present at site as well. Bone (not collected) was seen on disturbed surface in Area C and did not appear to be associated with any lithic debris. Roadtrail through the site has disturbed areas A and B, especially the post-ash occupation(s) therein, though intact buried deposits do exist. Further testing of site is needed to better assess stratigraphy and extent of deposits.

Collection Summary: 29 flakes including biface trimming specimens, of various sizes, with and without platforms, made of grey, grey/green and brown cherts and 1 obsidian specimen.

Appendix B

List of Sites Used in Study of Site Locations

(along with their terrain type and other locational data)

Note: -for explanation of Soil Ass. (Soil Association) Abbreviations,
& Genetic 1 (First Genetic Material) Abbreviations,
& Genetic 2 (Second Genetic Material) Abbreviations,
see accompanying text.

-Dist. to Water (column 5) refers to distance from site to closest waterbody, river or creek.

-Drainage (column 6) refers to the type of waterbody, river or creek that the site is closest to. The waterbody categories are: major lake - Bennett, Nares, Tagish, Marsh, Laberge, Little Atlin, Atlin, Teslin
medium lake- lakes greater than 1 square kilometre, excluding the major lakes
small lake - lakes less than 1 square kilometre.

Borden #	Soil Ass.	Genetic 1	Genetic 2	Dist. to Water	Drainage
JaUd-1	Mb1	M	L	beside	major lake
JaUd-2	Mb1	M	L	beside	major lake
JaUd-3	Mb1	M	L	beside	major lake
JaUd-4	Mb1	M	L	beside	major lake
JaUe-2	Mb2	M	L	beside	major lake
JaUe-3	Mb2	M	L	beside	major lake
JaUe-4	Mb2	M	L	beside	major lake
JaUe-5	Mb2	M	L	beside	major lake
JaUh-1	Bb2	G	M	beside	small lake
JaUi-1	Bb2	G	M	beside	small lake
JaUi-2	Bb2	G	M	beside	small lake
JaUi-3	Jd1	G		beside	other lake
JaUi-4	Jd1	G		beside	medium lake
JaUi-5	Jd1	G		beside	medium lake
JaUi-6	Bb1	G	M	beside	medium lake
JaUi-7	Bb2	M	G	beside	small lake
JaUj-1	Jd2	G		beside	medium lake
JaUj-2	Jd2	G		-½km	medium lake
JaUj-3	Bb2	M	G	-½km	medium lake
JaUj-4	Bb2	M	G	beside	creek/tributary
JaUj-5	Bb2	M	G	-½km	creek/tributary
JaUk-01	Jd1	G		beside	medium lake
JaUk-02	Ch2	L		beside	creek/tributary
JaUk-03	Jd1	E	G	beside	creek/tributary
JaUk-04	Jd1	E	G	beside	creek/tributary
JaUk-05	Jd1	E	G	beside	creek/tributary
JaUk-06	Jd1	E	G	beside	creek/tributary
JaUk-07	Jd1	G	A	beside	medium lake
JaUk-08	Jd1	G	A	beside	medium lake
JaUk-09	Jd1	G	A	beside	medium lake
JaUk-10	Bb1	M	G	-½km	medium lake
JaUk-11	Jd1	G		beside	medium lake
JaUk-12	Jd2	G		beside	medium lake
JaUk-13	Jd2	G		beside	medium lake
JaUk-14	Jd2	G		beside	medium lake
JaUk-15	Jd2	G		beside	medium lake
JaUk-16	Jd2	G		beside	medium lake
JaUk-17	Jd2	G		beside	medium lake
JaUk-18	Jd2	G		beside	medium lake
JaUk-19	Jd1	E	G	1½km	river
JaUk-20	Jd1	G	A	beside	major lake
JaUk-21	Jd1	G	A	-½km	medium lake
JaUk-22	Jd1	G	A	beside	medium lake
JaUk-23	Jd1	G	A	beside	medium lake
JaUl-1	Ch1	E	G	beside	creek/tributary
JaUl-2	Ch2	L		beside	creek/tributary
JaUl-3	Ch2	L		beside	creek/tributary
JaUl-4	Ch1	E	L	+½km	river
JaUl-5	Ch2	L		beside	creek/tributary
JaUl-6	Ch2	L		beside	creek/tributary

Borden #	Soil Ass.	Genetic 1	Genetic 2	Dist. to Water	Drainage
JaUm-1	Ws2	M	A	beside	major lake
JaUm-2	Ws2	M	A	beside	major lake
JaUn-1	Ws1	M		beside	major lake
JaUn-2	Gr1	M	C	-½km	creek/tributary
JaUn-3	Mb1	M	L	-½km	creek/tributary
JaUn-4	St1	A		beside	major lake
JaUn-5	Ws2	M	A	beside	major lake
JaUo-1	Mb1	E	L	½km	major lake
JaUo-2	Mb1	E	L	beside	major lake
JaUo-3	Mb1	E	L	beside	major lake
JaUo-4	Mb1	E	L	beside	major lake
JaUo-5	Mb1	E	L	beside	major lake
JaUo-6	Mb1	E	L	-½km	major lake
JaUp-01	Ws1	M	R	beside	major lake
JaUp-02	Jd1	G		beside	small lake
JaUp-03	Gr2	M	C	beside	small lake
JaUp-04	Ws1	M	R	beside	major lake
JaUp-05	Ws1	M	R	beside	major lake
JaUp-06	Ws1	M	R	½km	major lake
JaUp-07	Ws1	M	R	beside	major lake
JaUp-08	Ws1	M	R	-½km	major lake
JaUp-09	Ws1	M	R	-½km	major lake
JaUp-10	Ws1	M	R	beside	major lake
JaUp-11	Ws1	M	R	beside	major lake
JaUp-12	Ws1	M	R	beside	major lake
JaUp-13	Ws1	M	R	beside	major lake
JaUp-14	Gr1	M	C	beside	major lake
JaUp-15	Gr1	M	C	beside	major lake
JaUp-16	Ws1	M	R	beside	major lake
JaUp-17	Ws1	M	R	beside	major lake
JaUp-18	Mb2	M	L	beside	major lake
JaUr-1	St1	A	A	beside	major lake
JaUu-1	Ca1	C		½km	creek/tributary
JaUu-2	Jd1	G		beside	creek/tributary
JaUu-3	Jd1	G		-½km	creek/tributary
JaUu-4	Jd1	G		-½km	creek/tributary
JaUu-5	Jd1	G		beside	river
JaUu-6	Jd1	G		beside	river
JaUv-01	Ca1	C		-½km	creek/tributary
JaUv-10	St2	A	G	-½km	river
JaUv-11	St2	A	G	-½km	river
JaUv-12	St2	A	G	-½km	river
JaUv-13	St2	A	G	-½km	river
JaUv-2	Ws1	M	R	beside	medium lake
JaUv-3	Ws1	M	R	beside	medium lake
JaUv-4	Ws1	M	R	beside	medium lake
JaUv-5	Ws1	M	R	beside	medium lake
JaUv-6	Ws1	M	R	beside	medium lake
JaUv-7	Ws1	M	R	beside	medium lake
JaUv-8	St2	A	G	-½km	river

Borden #	Soil Ass.	Genetic 1	Genetic 2	Dist. to Water	Drainage
JaUv-9	St2	A	G	-½km	river
JaUw-1	Ws1	M	R	beside	medium lake
JaUw-2	Ca1	R	C	beside	medium lake
JaUw-3	St1	A		beside	medium lake
JaUw-4	Ca1	C		beside	medium lake
JaUw-5	Ca1	C		beside	medium lake
JaUw-6	Jd1	G		beside	medium lake
JbUe-1	Mb2	M	L	beside	major lake
JbUf-1	Mb1	M	L	-½km	major lake
JbUf-2	Ws3	M	O	beside	small lake
JbUf-3	St1	A		beside	major lake
JbUf-4	Mb1	M	L	beside	major lake
JbUg-07	St1	A		-½km	major lake
JbUg-08	St1	A		-½km	major lake
JbUg-09	St1	A		beside	major lake
JbUg-10	St1	A		beside	major lake
JbUi-01	Bb1	M	G	beside	medium lake
JbUi-02	Bb1	M	G	beside	creek/tributary
JbUi-03	Bb1	M	G	beside	medium lake
JbUi-04	Bb1	M	G	beside	medium lake
JbUi-05	Bb1	M	G	beside	medium lake
JbUi-06	Bb1	M	G	beside	medium lake
JbUi-07	Jd1	G		beside	medium lake
JbUi-08	Jd1	G		beside	medium lake
JbUi-09	Jd1	G	A	beside	medium lake
JbUi-10	Jd1	G		beside	medium lake
JbUi-11	Jd1	G		beside	medium lake
JbUi-12	Bb1	G	M	beside	medium lake
JbUi-13	Bb1	G	M	beside	medium lake
JbUi-14	Bb1	G	M	beside	medium lake
JbUi-15	Gr1	M	C	beside	medium lake
JbUi-16	Gr1	M	C	beside	medium lake
JbUi-17	Gr1	M	C	beside	medium lake
JbUi-18	Ws2	M		beside	medium lake
JbUi-19	Ws2	M		beside	medium lake
JbUi-20	Jd1	G	A	beside	medium lake
JbUi-21	Jd1	G	A	beside	medium lake
JbUi-22	Jd1	G	A	beside	medium lake
JbUi-23	Jd1	G	A	beside	medium lake
JbUl-1	Mb2	M	L	beside	major lake
JbUl-2	Ch2	L		beside	major lake
JbUm-1	Bb1	G	M	beside	major lake
JbUm-2	Bb1	G	M	beside	major lake
JbUn-01	Ch2	L		beside	river
JbUn-02	Ch2	L		beside	river
JbUn-04	St1	A		beside	river
JbUn-05	St1	A		beside	river
JbUn-06	Mb2	L	M	-½km	creek/tributary
JbUn-07	Ch1	E	L	beside	major lake
JbUn-08	St1	A		beside	river

Borden #	Soil Ass.	Genetic 1	Genetic 2	Dist. to Water	Drainage
JbUn-09	St1	A		beside	river
JbUn-10	St1	A		beside	river
JbUn-11	Ch1	E	L	beside	river
JbUn-12	Ch1	E	L	beside	river
JbUn-13	Ws1	M	R	beside	major lake
JbUn-1.	Ws1	M	R	beside	major lake
JbUn-15	Ws1	M	R	beside	major lake
JbUn-16	Mb1	E	L	beside	major lake
JbUn-17	Mb1	E	L	beside	major lake
JbUn-18	St1	A		beside	river
JbUn-19	St1	A		beside	river
JbUn-20	St1	A		beside	river
JbUo-1	Ws2	M		-½km	medium lake
JbUo-2	Mb1	E	L	beside	major lake
JbUo-3	Mb1	E	L	beside	major lake
JbUo-4	Mb1	E	L	beside	major lake
JbUo-5	Mb1	E	L	beside	major lake
JbUo-6	Mb1	E	L	beside	major lake
JbUp-1	Gr1	M	C	-½km	small lake
JbUq-01	Cs2	E		beside	major lake
JbUq-02	Cs1	E		-½km	major lake
JbUq-03	Cs2	E		-½km	major lake
JbUq-04	Cs2	E		-½km	major lake
JbUq-05	Cs1	E		½km	major lake
JbUq-06	Cs1	E		beside	major lake
JbUq-07	Cs1	E		beside	major lake
JbUq-08	Cs1	E		beside	major lake
JbUq-09	Cs1	E		beside	major lake
JbUq-10	Ch1	L	M	-½km	river
JbUq-11	Ch1	L		-½km	river
JbUq-12	Wt2	A		-½km	river
JbUq-13	Wt2	A		-½km	river
JbUq-14	Wt2	A		-½km	river
JbUq-15	Ch1	L		½km	river
JbUq-16	Ch1	L		½km	river
JbUq-17	Ch1	L		½+km	river
JbUq-18	Ch1	L		1+km	river
JbUq-20	St1	A		½km	river
JbUq-21	Ch1	L		-½km	major lake
JbUq-22	R	R	M	3+km	small lake
JbUq-23	Ch1	L		beside	small lake
JbUq-24	Ws1	M		-½km	river
JbUq-25	Cs2	E		-½km	major lake
JbUq-26	Cs1	E		beside	major lake
JbUq-27	Cs2	E		-½km	major lake
JbUq-28	Cs1	E		beside	major lake
JbUq-29	Cs2	E		beside	major lake
JbUq-30	Cs2	E		beside	major lake
JbUr-02	St1	A		½+km	river
JbUr-03	St1	A		½+km	river

Borden #	Soil Ass.	Genetic 1	Genetic 2	Dist. to Water	Drainage
JbUr-04	St1	A		½+km	river
JbUr-05	St1	A		1km	river
JbUr-06	St1	A		1km	river
JbUr-07	St1	A		1km	river
JbUr-08	St1	A		1km	river
JbUr-09	Jd1	G		½+km	creek/tributary
JbUr-10	Jd1	G		½km	creek/tributary
JbUr-11	Jd1	G		-½km	creek/tributary
JbUr-12	Jd1	G		-½km	creek/tributary
JbUr-13	Jd1	G		beside	creek/tributary
JbUr-14	Jd1	G		beside	medium lake
JbUr-15	Jd1	G		-½km	medium lake
JbUr-16	Jd1	G		beside	medium lake
JbUr-17	Jd1	G		beside	medium lake
JbUr-18	Jd1	G		beside	creek/tributary
JbUr-19	Jd1	G		-½km	medium lake
JbUs-1	St2	A		-½km	river
JbUt-1	R	R	M	1km	river
JbUt-2	Mb2	M	L	½km	river
JbUt-3	Tn2	O	L	-½km	river
JbUt-4	Jd1	G	A	beside	small lake
JbUt-5	Mb2	M	L	-½km	river
JbUt-6	Wt2	A	O	beside	river
JbUt-7	Mb2	M	L	beside	river
JbUt-8	Wt2	A	O	beside	river
JbUt-9	Mb2	L	M	½km	river
JbUu-2	St2	A		beside	river
JbUv-1	Jd1	G	A	-½km	river
JbUv-2	Jd1	G	A	-½km	river
JbUv-3	Jd1	G	A	-½km	river
JbUw-01	Jd1	G	L	beside	medium lake
JbUw-02	Wt2	A		-½km	medium lake
JbUw-03	Jd1	G	L	-½km	medium lake
JbUw-04	Jd1	G	L	-½km	medium lake
JbUw-05	Jd1	G	L	beside	medium lake
JbUw-06	Jd1	G	L	beside	medium lake
JbUw-07	Jd1	G	A	beside	medium lake
JbUw-08	Jd1	G	A	beside	medium lake
JbUw-09	Jd1	G	A	beside	medium lake
JbUw-10	Jd1	G	A	-½km	medium lake
JbUw-11	Jd1	G	A	beside	medium lake
JbUx-1	St1	A		beside	medium lake
JbUx-2	Ca1	C	A	beside	medium lake
JcUh-1	Jd1	G	A	beside	major lake
JcUh-2	Mb1	M	L	beside	major lake
JcUi-1	Jd1	E	G	beside	small lake
JcUi-2	Wt3	A	O	beside	small lake
JcUi-3	Jd1	E	G	beside	medium lake
JcUj-01	Ws2	M		beside	medium lake
JcUj-02	Ws2	M		beside	medium lake

Borden #	Soil Ass.	Genetic 1	Genetic 2	Dist. to Water	Drainage
JcUj-03	Mb1	M	L	beside	medium lake
JcUj-04	Mb1	M	L	beside	medium lake
JcUj-05	Mb1	M	L	-½km	medium lake
JcUj-06	Jd1	G		-½km	medium lake
JcUj-07	Bb1	M	G	beside	small lake
JcUj-08	Bb1	M	G	beside	small lake
JcUj-09	Bb1	M	G	beside	small lake
JcUj-10	Ws2	M		beside	medium lake
JcUj-12	Mb1	M	L	beside	medium lake
JcUj-13	Mb1	M	L	-½km	medium lake
JcUj-14	Mb1	M	L	-½km	medium lake
JcUj-15	Mb1	M	L	beside	medium lake
JcUj-16	Mb1	M	L	beside	medium lake
JcUk-01	Jd1	G		beside	river
JcUk-02	Jd1	G		beside	river
JcUk-03	Jd1	G		beside	river
JcUk-04	Jd1	G		-½km	river
JcUk-05	Jd1	G		beside	river
JcUk-06	Jd1	G		beside	river
JcUk-07	Jd1	G		-½km	river
JcUk-08	Jd1	G	A	beside	small lake
JcUk-09	Jd1	G	A	beside	small lake
JcUk-10	Jd1	G		beside	river
JcUk-11	Jd1	G		beside	river
JcUl-1	Jd1	G	A	-½km	creek/tributary
JcUl-2	Jd1	G	A	-½km	creek/tributary
JcUm-1	Jd1	G		-½km	creek/tributary
JcUm-2	Jd1	G		-½km	creek/tributary
JcUn-1	Ch1	L		beside	creek/tributary
JcUq-1	Jd1	G	A	1km	river
JcUq-2	Jd1	G	A	½km	river
JcUq-3	Jd1	G	A	½km	river
JcUr-1	Mb1	L	M	½+km	medium lake
JcUr-2	St1	A	L	beside	creek/tributary
JcUr-3	Jd1	G		beside	medium lake
JcUr-4	Jd1	G		½km	medium lake
JcUr-5	Jd1	G		-½km	medium lake
JcUr-6	Jd1	G		beside	medium lake
JcUr-7	St1	A	L	-½km	river
JcUr-8	Wt2	A		beside	river
JcUs-2	Jd1	G		½+km	creek/tributary
JcUs-3	Jd1	G		1km	creek/tributary
JcUs-4	Jd1	G		1+km	creek/tributary
JcUt-01	Jd1	G	L	-½km	medium lake
JcUt-02	Jd1	G	L	-½km	medium lake
JcUt-03	Jd1	G	L	-½km	med. lake
JcUt-04	Jd1	G	L	-½km	med. lake
JcUt-05	Jd1	G	L	-½km	med. lake
JcUt-06	Jd1	G	L	-½km	creek/tributary
JcUt-07	Jd1	G	L	-½km	creek/tributary

Borden #	Soil Ass.	Genetic 1	Genetic 2	Dist. to Water	Drainage
JcUt-08	Jd1	G	L	-½km	creek/tributary
JcUt-09	Jd1	G	L	-½km	creek/tributary
JcUt-10	Jd1	G	L	-½km	creek/tributary
JcUt-11	Jd1	G	L	-½km	creek/tributary
JcUt-12	Jd1	G	L	-½km	creek/tributary
JcUt-13	Jd1	G	L	-½km	creek/tributary
JcUt-14	Jd1	G	L	-½km	creek/tributary
JcUt-15	Jd1	G	L	-½km	creek/tributary
JcUt-16	Jd1	G	L	-½km	creek/tributary
JcUt-17	Jd1	G	L	-½km	creek/tributary
JcUt-18	Jd1	G	L	-½km	creek/tributary
JcUw-1	Jd1	G		-½km	creek/tributary
JcUw-2	Ch4	L	A	beside	creek/tributary
JcUw-3	Jd1	G		-½km	creek/tributary
JcUx-1	St1	A		beside	other lake
JdUi-1	St1	A		beside	river
JdUi-2	Mb1	L	M	beside	river
JdUk-1	Jd1	G		beside	other lake
JdUm-1	Jd1	G		beside	other lake
JdUn-1	Ch1	L		-½km	major lake
JdUo-1	Cs2	E	L	-½km	major lake
JdUo-2	Ch4	L	O	beside	major lake
JdUo-3	Ch1	L		beside	major lake
JdUp-2	Ch1	L		beside	major lake
JdUq-1	Jd1	G		beside	river
JdUq-1	Ws1	M		beside	medium lake
JdUq-3	Ws1	M		beside	medium lake
JdUr-1	Ch1	L		beside	medium lake
JdUs-1	Jd1	G		beside	medium lake
JdUs-2	Jd1	G		1½km	river
JdUt-1	Ch2	L	G	-½km	medium lake
JdUt-2	Ch2	L	G	-½km	medium lake
JdUt-3	Ch2	L	G	-½km	medium lake
JdUt-4	Ch2	L	G	-½km	medium lake
JdUt-5	Jd2	G	L	-½km	medium lake
JdUt-6	Bb2	M		beside	small lake
JdUu-1	Jd1	G		-½km	medium lake
JdUu-2	Jd1	G		beside	river
JdUw-1	Bb2	M	G	beside	small lake
JeUs-1	Jd1	E	G	½+km	river
JeUs-3	Jd1	G		½km	river
JeUs-4	Jd1	G		beside	river
JeUt-01	Jd2	G	A	-½km	small lake
JeUt-02	Jd1	G	L	-½km	river
JeUt-03	Jd2	G	A	beside	creek/tributary
JeUt-04	Jd2	G	A	beside	medium lake
JeUt-05	Jd2	G	A	-½km	medium lake
JeUt-06	Jd2	G	A	½km	medium lake
JeUt-07	Jd2	G	A	½+km	medium lake
JeUt-08	Jd2	G	A	beside	small lake

Borden #	Soil Ass.	Genetic 1	Genetic 2	Dist. to Water	Drainage
JeUt-09	St2	A		½+km	creek/tributary
JeUt-10	Jd2	G	A	-½km	medium lake
JeUu-01	Jd1	G		-½km	river
JeUu-02	Jd1	G		-½km	river
JeUu-03	Jd1	G		-½km	river
JeUu-04	Jd1	G		-½km	river
JeUu-05	Jd1	G		-½km	river
JeUu-06	Jd1	G		-½km	river
JeUu-07	Jd1	G		-½km	river
JeUu-08	Wt2	A	A	-½km	river
JeUu-09	Jd1	G		-½km	river
JeUu-10	Jd1	G		-½km	river
JeUu-11	Jd1	G		beside	small lake
JeUu-12	Jd1	G		½km	river
JeUu-13	Jd1	G		beside	small lake
JeUu-14	Jd1	G		beside	small lake
JeUu-15	Gr1	C	M	-½km	creek/tributary
JeUu-16	Ws1	M		beside	creek/tributary
JeUu-17	Ws1	M		beside	creek/tributary
JeUu-1_	Ws1	M		-½km	river
JeUu-19	Ws1	M		beside	creek/tributary
JeUu-20	Ws1	M		beside	creek/tributary
JeUu-21	Jd1	G		½km	creek/tributary
JeUu-22	Ws1	M		-½km	creek/tributary
JeUu-23	Jd1	G		-½km	river
JeUv-01	Jd1	G		beside	creek/tributary
JeUv-02	Jd1	G		beside	creek/tributary
JeUv-03	Jd1	G		beside	creek/tributary
JeUv-04	Jd1	G		beside	creek/tributary
JeUv-05	Jd1	G		beside	small lake
JeUv-06	Jd1	G		beside	small lake
JeUv-07	Jd1	G		beside	small lake
JeUv-08	Jd1	G		½+km	river
JeUv-09	Jd1	G		beside	small lake
JeUv-10	Jd1	G		beside	small lake
JeUv-11	Jd1	G		beside	small lake
JeUv-12	Jd1	G		beside	small lake
JeUv-13	Jd1	G		beside	small lake
JeUv-14	Jd1	G		-½km	small lake
JeUv-15	Jd1	G		beside	small lake
JeUv-16	Jd1	G		-½km	river
JeUv-17	Jd1	G		beside	small lake
JeUv-18	Jd1	G		beside	small lake
JeUv-19	Jd1	G		1km	river
JeUv-20	Jd1	G		-½km	small lake
JeUv-21	Jd1	G		½+km	river
JeUv-22	Jd1	G		½+km	river
JeUv-23	Jd1	G		½+km	river
JeUv-24	Jd1	G		½+km	river
JeUv-25	Jd1	G		½+km	river

Borden #	Soil Ass.	Genetic 1	Genetic 2	Dist. to Water	Drainage
JeUv-26	Jd1	G		beside	creek/tributary
JeUv-27	Jd1	G		-½km	river
JeUv-28	Wt2	A	A	beside	river
JeUv-29	Jd1	G		1km	river
JeUv-30	Jd1	G		beside	creek/tributary
JeUv-31	Jd1	G		beside	river
JeUv-32	Jd1	G		beside	river
JeUv-33	Jd1	G		beside	small lake
JeUv-34	Jd1	G		beside	small lake
JeUv-35	Jd1	G		beside	small lake
JeUv-36	Jd1	G		beside	small lake
JeUv-37	Jd1	G		-½km	river
JeUv-38	Jd1	G		beside	creek/tributary
JeUv-39	Jd1	G		beside	creek/tributary
JeUv-40	Jd1	G		-½km	river
JeUv-41	Jd1	G		-½km	river
JeUv-42	Wt2	A	A	-½km	river
JeUv-43	Jd1	G		-½km	river
JeUv-44	Jd1	G		-½km	river
JeUv-45	Wt2	A	A	beside	river
JeUv-46	Jd1	G		beside	river
JeUw-01	Jd1	G		-½km	river
JeUw-02	Jd1	G		-½km	river
JeUw-03	Jd1	G		beside	river
JeUw-04	Jd1	G		beside	river
JeUw-05	Jd1	G		beside	river
JeUw-06	Jd1	G		-½km	river
JeUw-07	Jd1	G		-½km	river
JeUw-08	Jd1	G		-½km	river
JeUw-09	Jd1	G		-½km	river
JeUw-10	Ch1	L		½km	river
JeUw-11	Ch1	L		½km	river
JeUw-12	St1	A		½km	river
JeUw-13	Jd1	G		½km	river
JeUw-14	Jd1	G		½km	river
JeUw-15	Wt2	A	A	beside	river
JeUw-16	Jd1	G		beside	river
JeUw-17	Jd1	G		beside	river
JeUx-01	Ch1	L		beside	river
JeUx-02	Ch1	L		beside	river
JeUx-03	Ch1	L		beside	river
JeUx-04	Ch1	L		beside	river
JeUx-05	Ch1	L		beside	river
JeUx-06	Ws1	M	R	3+km	river
JeUx-07	Ws1	M	R	3+km	river
JeUx-08	Ws1	M	R	3+km	river
JeUx-09	Ws1	M	R	3+km	river
JeUx-10	Gr1	M	C	3+km	river
JeUx-11	Jd1	G		beside	creek/tributary
JeUx-12	Jd1	G		beside	creek/tributary

Borden #	Soil Ass.	Genetic 1	Genetic 2	Dist. to Water	Drainage
JeUx-13	Ch1	L		½km	creek/tributary
JeUx-14	Ch1	L		-½km	creek/tributary
JfUt-1	Ch1	E	L	beside	river
JfUt-2	St1	A	A	beside	river
JfUu-1	Ch1	L	M	½+km	river
JfUu-2	Ch1	L	M	½+km	river
JfUu-3	St1	A	A	beside	river
JfUu-4	St1	A	A	beside	river
JfUv-1	Ch1	L	M	-½km	creek/tributary
JfUv-2	Ch1	L	M	beside	creek/tributary
JfUv-3	Mb1	M	L	1½km	river
JfUw-1	Ch1	L		beside	river
JfUw-2	Mb1	M	L	-½km	creek/tributary
JfUw-3	Ch4	L		-½km	river
JfUw-4	Ch4	L		-½km	river
JfUw-5	Ch4	L		-½km	river
JfUw-6	Ch4	L		-½km	river
JfUw-7	Ch4	L		-½km	river
JfUw-8	Ch4	L		-½km	river
JfUw-9	Ch4	L		-½km	river
JfUx-01	Ws1	M	R	3km	river
JfUx-02	St1	A	A	beside	creek/tributary
JfUx-03	St1	A	A	beside	creek/tributary
JfUx-04	St1	A	A	beside	creek/tributary
JfUx-05	St1	A	A	beside	creek/tributary
JfUx-06	St1	A	A	-½km	creek/tributary
JfUx-07	St1	A	A	-½km	creek/tributary
JfUx-08	St1	A	A	beside	creek/tributary
JfUx-09	St1	A	A	-½km	creek/tributary
JfUx-10	St1	A	A	-½km	creek/tributary
JfUx-11	St1	A	A	beside	creek/tributary
JfUx-12	St1	A	A	-½km	creek/tributary
JfUx-13	Ch1	L	G	-½km	creek/tributary